

APPENDIX TO THE REPORT OF THE MINISTER OF AGRICULTURE

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

FOR THE

Year ending March 31

1909

Introduction.

Part I.—The Dairy Division.

Part II.—Report of the Assistant Dairy Commissioner.

Part III.—The Extension of Markets Division.

Part IV.—The Fruit Division.

Part V.—The Cold Storage Division.

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1909

APPENDIX

TO THE

REPORT OF THE MINISTER OF AGRICULTURE

BEING THE

REPORT OF THE DAIRY AND COLD STORAGE
COMMISSIONER.

OTTAWA, March 31, 1909.

To the Honourable,

The Minister of Agriculture,

SIR,—I have the honour to submit my report as Dairy and Cold Storage Commissioner in your department, for the year ended March 31, 1909.

The report is presented in five parts as follows:—

Part I. Dairying.

Part II. Report of the Assistant Dairy Commissioner.

Part III. Extension of Markets.

Part IV. Fruit.

Part V. Cold Storage.

The Dairy Division.—I would draw your attention to the results of the experiments in the handling and care of milk for cheese making, which were carried out during the summer of 1908. I have to acknowledge the careful work of Mr. Geo. H. Barr, chief officer of the Dairy Division, who personally took charge of these experiments, and who has prepared the report thereon, which appears in the following pages. In presenting the results of these experiments to the dairymen at public meetings during the present winter, Mr. Barr has made very effective use of lantern slides. This method of disseminating information has been found so helpful that it is proposed to make considerable use of it in the future.

The records of the cow testing work are again published in some detail. The interest in this important movement continues to grow. We hope to extend the scope of the work during the coming season by encouraging owners of herds to keep a record of the feed consumed by the individual cows, or at least a record of the average cost of feeding the herd.

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The Assistant Dairy Commissioner.—Mr. J. C. Chapais, who has filled this position since the dairying service was inaugurated in 1890, resides at St. Denis (en bas), Quebec. A reference to his report will indicate the nature of the work which is assigned to him. Mr. Chapais has a very intimate knowledge of the province of Quebec and especially of the French speaking sections. His services as a lecturer on dairying, fruit growing and other agricultural topics are in constant demand.

The Extension of Markets Division.—The inspection of the iced car services and the cargo inspection carried on at Canadian and United Kingdom ports, are the chief lines of work assigned to this division of the branch. The chief officer is Mr. W. W. Moore, who receives the reports of the various inspectors. We have been able to make such use of the information which these reports contain as to effect much improvement in the transportation of all kinds of perishable food products. The details given in Part III. should be of interest to manufacturers of cheese and butter, fruit growers, exporters of and dealers in these and similar products.

The Fruit Division.—The Dominion fruit inspectors are under the supervision of this division and they report through the chief officer, Mr. A. McNeill. Part IV. of this report, which refers to the Fruit Division, gives some details of the work of inspection and the convictions for violations of the law governing the marking and grading of fruit. The effect of the amendments to the law which were passed during last session of parliament is referred to. The Fruit Crop Report issued monthly during the summer months entails considerable work and constant pushing to secure prompt publication. The fruit inspectors have been employed during the slack season attending orchard meetings and fruit institutes. The demand for assistance of this kind is much keener than it formerly was. The farmers in many districts where fruit growing has been a mere 'side line' are beginning to realize the possibilities which lie beyond careful orchard work.

The Cold Storage Division.—In Part V., which covers the cold storage work of this branch, particulars are given of the bonuses for creamery cold storages and the various iced car services arranged for with the several railway companies.

The arrangement made, with your authority, for the reservation of cold storage chambers on certain steamships for the carriage of fruit only, proved satisfactory to shippers. Considerable impetus was given to the shipment of early and tender fruits to Great Britain. The chambers were so well filled that only a small claim, amounting to \$251.06 has been made on the Department of Agriculture under the guarantee which was given for the earnings of the space.

The work connected with the administration of 'The Cold Storage Act' has increased considerably during the year and there is more activity in the construction of cold storage warehouses.

THE ILLUSTRATIONS.

Some of the illustrations have been inserted in this report more as a matter of record than because they have any connection with the text. I have thought it fitting to reproduce a picture of the late Hon. Thomas Ballantyne, whose name was so prominently identified with Canadian factory dairying from its very inception to the time of his death.

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Mr. Harvey Farrington, who died in 1878, is an interesting figure in the dairy history of this country, because of the fact that he started the first cheese factory in Canada near Norwich, in the County of Oxford, Ontario, in the year 1864.

The modelled butter at the Franco-British Exhibition is reproduced as a novelty which attracted much attention from visitors to the Canadian section of that exhibition.

The plates which show collections of fruit at exhibitions in Canada will give some idea of the great progress which has been made in the packing of apples during recent years.

The illustrations which accompany Mr. Barr's report on the experimental work in the care of milk, show very clearly the results of different treatment of the milk. These will be particularly interesting to cheesemakers.

ACKNOWLEDGMENTS.

I have pleasure in again acknowledging the loyal assistance which I have received from members of the staff in carrying on the work of the branch.

Messrs. McNeill, Moore and Barr have attended to the details of their respective divisions in a most conscientious, painstaking and careful manner. I cannot speak too highly of the useful work which they have done. I am indebted to them and to Mr. Whitley for valuable help in the preparation of this report. Mr. Whitley's work in connection with the records of the Cow Testing Associations is too well known to need any comment.

Mr. Jos. Burgess, of the outside staff, filled the position of acting official referee of butter and cheese during the season of 1908, and gave entire satisfaction in that capacity. He has also done excellent work in promoting the cool curing of cheese and the organization of cow testing associations during the winter months.

Mr. J. N. Lemieux, who also belongs to the outside staff, has rendered good service as refrigerator car inspector and in connection with our campaign in favour of cool cheese curing and cow testing.

Mr. J. G. Bouchard, creamery cold storage inspector, and Mr. I. Trudel, supervisor of cow testing in Quebec, both deserve favourable mention.

Mr. Harvey Mitchell, who represents the Dairy Division in the Maritime Provinces, joined the service during the year and he brings to bear on his work a long experience in dairying and is well equipped to carry on the work in that part of Canada.

Mr. D. M. Macpherson, Inspector of Dairy Products, has been active during the year in enforcing the dairy laws. Fortunately, these laws are well observed in Canada.

I wish also to acknowledge the assistance which I have received from Mr. F. T. Shutt, Chemist, Experimental Farms, in connection with questions of a chemical nature.

This branch is much indebted to the Department of Inland Revenue for co-operation in the enforcement of the dairy laws.

I have the honour to be, sir,

Your obedient servant,

J. A. RUDDICK,
Commissioner.

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

FOR THE

FISCAL YEAR ENDING MARCH 31,

1909.

PART I—DAIRYING.

CONTENTS.

Addresses at Dairy Conventions—Condensed Milk—Canadian Dairy Produce at Franco-British Exhibition—Report of Acting Official Referee for Butter and Cheese—Outlook for Canadian Dairying—Aeration of Milk for Cheesemaking—Statistics of the Dairy Trade—In Memoriam—Cow Testing Associations—Dairy Records.

PART I—DAIRYING.

ADDRESSES AT DAIRY CONVENTIONS.

The following addresses, delivered before the Dairymen's Associations of Ontario, deal with questions of general interest to all Canadian dairymen. Although these addresses have already received some publicity through the press and in the reports of the associations, some of the questions touched upon are believed to be of sufficient importance to warrant wide circulation and even repetition.

(Dairymen's Association of Eastern Ontario,
Prescott, January 7, 1909.)

THE DAIRY SITUATION IN EASTERN ONTARIO.

By J. A. Ruddick, Dairy and Cold Storage Commissioner.

It is now twenty-six years since I first came into close touch with the dairy industry of Eastern Ontario, as Superintendent of the Allengrove combination of cheese factories, in the counties of Glengarry, Stormont and Prescott. A large number of the factories in that part of the country were started in the eighties, so that my connection goes back to the early days of the industry, and it is quite natural that I should have watched the development of this section with particular interest. In the spring of the year 1889, I quit the manufacturing end of the business to take up educational work, at the invitation of this association, for it was in that year that Mr. Publow and I were appointed instructors for that part of Ontario lying east of Kingston, my particular territory being all east of the Brockville and Ottawa Railway line. For two years I covered the whole of this large district, but it must be obvious to any one who knows the country that my efforts were necessarily spread rather thinly where so much ground had to be gone over. Since joining the Dominion service in 1891, I have come into contact with other phases of the industry, and more particularly with its commercial side and the problems connected with storage and transportation. I have had exceptional opportunities, through access to literature, travel and personal contact with experts from all over the world, for acquiring information relating to the dairy industry in its various aspects, both productive and commercial. I make this rather personal reference to establish my claim, as it were, to speak with some authority on the dairy situation in Eastern Ontario, with particular reference to the extreme easterly portion of it.

I shall confine my remarks to the cheesemaking branch of the industry, not because the buttermaking branch is of no importance to those engaged in the manufacture of cheese, but because the inclusion of both branches would make the subject too large for this paper.

THREE DISTRICTS IN EASTERN ONTARIO.

[Eastern Ontario, viewed from the standpoint of cheese production, divides naturally into three main districts, each with certain features which distinguish it from the others, and which for the present purpose may be designated as the Central Ontario, Brockville and eastern districts. The Central Ontario district, which includes Prince Edward, Hastings and Peterborough counties, and of which the old Belleville district was the beginning and is yet a kind of natural centre, was the first part of Eastern

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Ontario to win prominence in the cheesemaking industry. The cheese from this district early acquired a good reputation on the British market and the Belleville district was recognized as leading Eastern Ontario twenty-five or thirty years ago.

The factory system was started near Brockville about the same time as it was in the Belleville district, but the development was somewhat slower. The limits of the Brockville section have never been very clearly defined. It is said that at times the boundaries have been stretched to take in a good part of Eastern Ontario. It has even been hinted that portions of the province of Quebec have been included, but we are not concerned with that phase of the question at present.

The third or eastern district embraces the territory included in the Ottawa Valley and the counties of Glengarry, Stormont and probably Dundas, or, in other words, the country lying north and east of the Brockville section proper. This was the last part of Ontario to engage in dairying extensively, and probably the most notable feature of the development of the industry in these counties was the organization of large combinations of factories under one management. The Allengrove combination of factories, now broken up, was the largest ever known in the history of Cheddar cheesemaking. That combination, along with several others, at one time practically controlled the manufacture of cheese in these counties. It is not unreasonable to suppose that the combination plan of organizing the factory end of the cheese business has had some influence on the progress of the industry in a territory where it was so generally followed. The system has many advantages, especially where conditions tend towards small factories. It also has some disadvantages and one is that the patrons and the management are not brought into close contact with each other, with the result that the patrons do not learn to take the same lively interest in the business as they do where the co-operative or single proprietary factory systems prevail. In one respect the pioneer factory owners of the eastern district, although they are deserving of the greatest credit for their early enterprise, made a serious error in adopting a low standard for their buildings and equipment. This gave the section a bad start, from which it has never recovered, for we still find in the extreme eastern counties the poorest buildings and the most unsatisfactory conditions surrounding the manufacture of cheese which are to be found in any part of Ontario.

EXTENT OF THE CHEESEMAKING INDUSTRY.

It will be interesting at this point to consider the extent and distribution of the cheesemaking industry in Eastern Ontario. According to the returns of the Census and Statistics Office for 1907, the counties lying east of York and Simcoe, but not including these two, produced in that year 104,367,739 pounds of cheese, valued at nearly \$11,000,000, or considerably over two-thirds of Ontario's total output. We find that the business of dairying is most extensively followed in the eastern group of counties, which, including Leeds and Carleton, are credited with over one-third of the total production of the cheese in Ontario. The exact figures for the counties of Leeds, Grenville, Dundas, Stormont, Glengarry, Prescott, Russell and Carleton are 49,404,287 pounds, valued at \$5,760,555. The county of Dundas produces more milk per acre than any other county in Canada, the value of the cheese from that comparatively small county in 1907 being over one million dollars. No other section of Ontario is so largely devoted to dairying as that which comprises the counties in the extreme east. The farm revenues depend more on dairying in this district than they do in any other division of the province. In the counties bordering on Lake Ontario, fruit growing, the canning industries and beef raising divide the attention of the farmers to some extent, and in Western Ontario the diversity of farm industries is even more pronounced.

RELATIVE PROGRESS OF DISTRICTS.

Let me refer again to Central Ontario. I have already stated that this district was a leading one some years ago; but having attained that position, the dry rot of con-

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tentment began to take effect and before many years the Belleville district was obliged to yield the banner to the Brockville section. I am not sure that my Belleville friends will admit this, but that is the way it looks to a disinterested observer. There is more to be said in this connection, however, because as soon as the dairymen of that district realized that they had lost the place of honour, although it took some years to convince them of the fact, they immediately set about putting their house in order, with what result we shall see as we proceed. The beginning of the cool curing movement found the district in a receptive mood, and this means of recovering their position has been adopted to such an extent that within the past five years a large number of the factories in the counties of Prince Edward, Hastings and Peterborough have been equipped with cool curing rooms. In this important reform the district, especially Prince Edward County, easily leads Eastern Ontario. Every cheese factory in the Township of Ameliasburg is now equipped with a cool curing room. I am informed that the one factory which did not adopt the improvement has closed its doors and that the milk will go to the others. All told, there are thirty cool curing rooms in the Central Ontario district. I would not have you think that I look upon cool curing as the whole thing in progressive cheesemaking; but I do look upon it as a very important factor in determining the reputation of the cheese of any particular district. I am only repeating common talk in the trade when I say that the Central Ontario district, especially the Picton section, has come rapidly to the front again since it adopted the cool curing system so generally.

Now let us see what has been doing meantime in the other districts. I find that there are only seven cool curing rooms east of Kingston, all of which may be credited to the Brockville section, because there is not a single one, as far as I know, in the eastern district.

I am afraid it is a case of history repeating itself, and that the dairymen of the Brockville section have, like their brethren of Belleville at an earlier period, already mentioned, been relying on past achievement rather than on present effort, and in consequence they have been standing still while other districts have been going ahead. I say this with all kindness and without any intention of giving offence to my friends in this district. I ask them to bear in mind that I am quoting actual facts, not opinions, in support of this conclusion. I am not responsible for the facts.

PROGRESS OF COW TESTING WORK.

Another matter has attracted my attention in preparing this review of the dairy situation in Eastern Ontario, which I think is worth mentioning. Members of the convention are aware that the branch of the Department of Agriculture over which I have the honour to preside has for several years been encouraging the organization of cow testing associations for the purpose of studying the performance of individual cows. Many people think this movement is calculated to add more to the profits of dairying than any other scheme which has ever been proposed with that end in view. I need not go into details, because the subject has been ably presented by my assistant, Mr. Whitley. It will be sufficient to say that there are twenty of these associations in Eastern Ontario. Of this number fourteen are in the Central Ontario district, which leaves only six east of Kingston, although the same effort at organization has been made in all parts of the country. These two movements, the cool curing of cheese and the improvement of the dairy herds, strike to the root of profitable dairy farming, the one by increasing the yield per cow, the other by improving the quality of cheese and thus insuring a good demand at a higher level of prices. For these reasons they deserve the careful attention of all dairymen.

Now we come to a point which should be emphasized. I have tried to show you that these three districts of Eastern Ontario have been progressing along certain lines in inverse ratio to their dependence on the dairy industry.

Does it not seem remarkable that the farmers who derive the largest proportion of their revenue from dairying appear to be the ones who are giving the least study

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to questions affecting their interests? I put it that way because it can be nothing but a lack of information which results in such backwardness as I have described. No intelligent man can have any doubt as to the value of the cool curing of cheese, or of the keeping of records of his dairy herd, once he is in possession of all the facts bearing on these questions.

Mr. Whitley has given you some facts concerning the testing of dairy cows, and I ask your indulgence while I give you some of the facts in regard to the cool curing of cheese. My opportunities for getting information on the subject have been many, and I state most positively, after comparing the results of hundreds of tests, that I have invariably found the cheese cured at 60 degrees and under to be better in flavour and texture than other cheese from the same vat, cured at higher temperatures. But I do not ask you to take my unsupported word for it. I refer you to the pages of my annual reports for opinions of cheese merchants in Great Britain; ask any honest buyer in this country; ask Mr. Publow, the chief instructor; ask any of the instructors whose territory includes cheese factories with cool curing rooms; ask the representatives of any of these factories, and be guided by what they say. I shall be glad to send any one a list of all the cheese factories in Ontario which are equipped with cool curing rooms. Here is what some of them say:—

Mr. J. A. Holgate, patron and salesman of the Foxboro factory, in a letter recently received from him, makes the following statement: 'I have tried to make a careful estimate of the matter and I am convinced that in the last two years, during which we have had a cool curing room, we have had at least \$600 a year profit from cool curing, on an output of 200,000 pounds of cheese, besides the satisfaction of having an article of cheese that all the buyers want. Our factory cost us about \$600 more with the cool curing room than it would have cost without the ice chamber.' That is to say, they were repaid for the outlay in one year.

Mr. G. A. Gillespie, of the Central Smith factory, writes: 'It is quite safe to say that they (the patrons) have realized \$900 in three seasons from an outlay of about \$400.'

Mr. J. R. Anderson, a patron of the Mountain View factory, says: 'I can honestly say that we are pleased with the cool curing of cheese here.'

Mr. T. E. Whattam, Dairy Instructor in Prince Edward County, writes: 'In talking with the factorymen who have cool curing rooms, I find them well pleased with the results they have had, and confident that there are better things in store in the future when the benefits of cool curing are better known by the trade as a whole. I wish to say there is no comparison in the quality of cheese cured in the ordinary way and those cured in the cool rooms. I believe cool curing has helped the industry in this district more than any other advanced step in dairying in late years.'

I could cite any number of similar statements. The gains mentioned are made up partly by saving of shrinkage and partly by increased price as compared with what would have been received for the same cheese had they been ordinary-cured.

I am well aware that cool-cured cheese do not receive the premium that they should over ordinary-cured, but I would like to point out that the value of cool curing is not to be measured wholly by the relative price at which the cheese sell. There are many advantages besides an advanced price for the cheese, all of which put extra money into the pockets of the milk producers. In the first place there is a saving of shrinkage, which is very considerable, amounting to about one per cent. In many cases there is a saving of cuts, because there are many cheese which pass without question when cool-cured, that would have developed undesirable flavours and other objectionable qualities if cured at ordinary temperatures. The patrons of factories with cool curing rooms receive more money for their milk than they would if the cheese were ordinary-cured.

Then I would remind the dairymen of Eastern Ontario that every pound of cheese they have sold during the past season brought a higher price, relatively, than it would have done if a certain number of the factories had not provided cool curing rooms and

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thus raised the general average quality of all the cheese and increased the demand by encouraging consumption. I have not heard that any of the factories where the improvements have not been made, have objected to receiving this premium on the price of their cheese.

The cool curing movement has emphasized the importance of cool transit and has attracted attention to that end of the business. The result is that all Canadian summer cheese are now landed in Great Britain in cooler condition and milder in flavour than they formerly were, a circumstance which has materially helped to give tone to the market.

Now it must be admitted that the Belleville and Picton districts differ from the Brockville section in this respect, that the factories there are mostly owned by the farmers themselves, while in the Brockville and eastern district they are more largely proprietary. This is probably the reason why the Central Ontario factories as well as those in Western Ontario have been quicker to take hold of this question. But it is not a sufficient reason, for if it has paid the patrons of the co-operative factories, as shareholders in the companies, to incur the necessary expense, will it not pay the patrons of proprietary factories, who will derive all the benefit, to contribute in some manner to the cost of securing the improvements?

The owners of factories can hardly be expected to meet the whole expense out of the low rate for manufacturing which now prevails, in view of the fact that they will not receive any direct benefit from it.

Now, are the dairymen of the Brockville district going to repeat what they did some years ago when they wrested the supremacy from the old Belleville district, or are these two eastern sections to go on losing probably a quarter of a million a year through failure to take advantage of modern improvements, and at the same time endanger the future of a trade which is of so much importance to them? New Zealand is every year becoming more of a factor in the cheese trade, having doubled her output in two years. Now, note this point: the cheese from that country are all practically cool-cured, because the weather is never as hot there as it is here. This is a new kind of competition and it presents some features which should cause Canadians interested in the cheese industry to do some thinking. Bear in mind that New Zealand cheese arrive in Great Britain during the winter and spring months, or the period of non-production in Canada. If we continue to send cheese of indifferent quality, with heated flavours, &c., merchants in the old country will be disinclined to stock up with them for winter trade, but will wait and get a supply of the New Zealand cool-cured and thus encourage the production of more and more cheese in that country. New Zealand is not a large country, but it is large enough to produce an enormous quantity of dairy produce if there is sufficient encouragement. The output of cheese in New Zealand this year will be, roughly speaking, 400,000 boxes, quite enough to have a material influence as well as a sentimental effect on market conditions. I do not think the alarm which is felt in some quarters over New Zealand competition will be justified if those engaged in the cheese industry in this country make the most of their opportunities. Our safeguard is to make a superior article so as to get a firm position in the market, but to do so, we must adopt every reasonable means to that end. We should surely avail ourselves of a plan which ensures immediate returns for the outlay as well as security for the future.

Incidentally I would remind the members of the convention that I am prepared to send plans and specifications for cool curing rooms, free of cost, to any one who applies for them. We will give every assistance in our power towards the building of new factories or in remodelling old ones.

CENTRAL WAREHOUSE FOR CHEESE.

There is another question, somewhat related to the cool curing of cheese, on which I have received some inquiries during the past year and which may be of some interest to this meeting. I refer to the proposal to erect central warehouses at points

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in Eastern Ontario, where the cheese could be collected for the purpose of inspection and sale. It has not been made at all clear whether such proposed warehouses are intended to be cool cheese curing rooms or cold storage warehouses. Most probably the proposers have not been very clear on the point themselves. The distinction is a necessary one, however, because the two things are entirely different.

One thing is certain, and it is this: the benefits of cool curing cannot be secured with a central warehouse unless the cheese are delivered there every day, and that means extra expense as against the usual plan of delivering to the shipping point once a week, or when a sale is made.

Another point to note is that the government cold storage subsidy cannot be secured unless the warehouse is equipped with mechanical refrigeration, and it would be very poor business policy to incur the expense necessary to so equip a cheese storehouse in a locality where ice is available and where a temperature not below 50 degrees is required.

There may be certain localities where the central curing room idea, or a warehouse through which the cheese could pass for inspection and sale, would work out to advantage, but on the whole, the suggestion does not appeal to me as a very practical one.

It is a very convenient way to sell the cheese. We found it so when the government cool curing rooms were in operation, but the advantages are not worth the additional cost which is thus incurred in the marketing of the cheese, all of which must come out of the milk producer, and which will be greater than appears to be generally supposed.

It has been said that the cheese would be sold on their merits under such a plan and that there would be proper discrimination in price according to quality. It is a very regrettable feature of the cheese trade as well as of other trades, that the producer of a superior article does not always receive the premium which he should. It is generally admitted that nothing would so quickly bring about improvement in the quality of cheese as to have them sold strictly on their merits, but I fail to see why it should be assumed that this reform would be brought about through the medium of local warehouses. The same forces which now impel the buyer to pay a uniform price, and which influence the salesman to demand it, would be at work under those conditions just as they are under any other.

It seems to have escaped the attention of some people that the principal reason why cheese are bought without proper discrimination in quality is because the salesmen demand a uniform price. If John Jones sells his cheese for 12 cents, all the other factories in the neighbourhood insist on getting 12 cents also, regardless of quality. Every person knows that this is what happens at the cheese boards. It is what would happen in a warehouse if the cheese were being sold under the trier, because just as soon as a salesman found that he was not being paid the ruling price for his cheese he would withdraw and offer them through some other channel; so the buyer does business along the line of least resistance.

I have for some years thought that the best plan for selling Eastern Ontario and Quebec cheese would be to have a central receiving warehouse at Montreal, where the cheese could be officially graded and then sold by auction, without any recourse. That is to say, the price bid at the auction would be final. The official grading would relieve the buyer of the onus of discrimination, which appears to be the chief difficulty at present. This plan would not involve extra handling or expense, because the cheese would be going through the most direct channel. But there are many obstacles of a commercial nature in the way of giving effect to such a plan, and the disinclination on the part of the average salesman to accept a verdict which puts his cheese out of first grade, no matter how independent or reliable the official may be who passes judgment on them, would be a difficulty in the way of successful operation.

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THE SELLING OF CHEESE.

There has been some discussion in Eastern Ontario recently about methods of selling cheese, and the question has been magnified to an extent out of all proportion to its importance compared with other matters affecting the industry. The result of this agitation, as far as it can be said to have had any result, has been to divert the attention of some dairymen from questions of much more real importance to them. The manner in which the agitation has been conducted has been harmful by creating ill-feeling between different classes or interests connected with the trade. If there are any wrong practices, and I shall not deny that there have been, they will not be put right by wholesale charges of dishonesty or mean insinuations and abuse of those who may offer contrary opinions. Abuse is not argument and it is always the resort of a man who has a weak case. I know the men who are included in the different divisions of the cheese trade, from patron to buyer, as well as any person, and I am bound to say that I have found one just as honest as the other. It will do no good to create unwarranted suspicion in the minds of those who have to deal with each other.

In regard to the selling of cheese, I would repeat again that there is only one thing of real importance, and that is to have an article of superior quality. All other considerations are insignificant in comparison. The factories which have earned a good reputation by turning out a superior article year after year never have any trouble. The competition for their cheese enables them to pick and choose as to whom they shall sell them to. Of course, ordinary business prudence demands that some care shall be exercised in dealing only with houses in good financial standing.

SALESMEN SHOULD BE COMPETENT.

It is important also that the business of selling the cheese should be put in the hands of competent men. There are a great many men acting as salesmen for cheese factories who have no special knowledge to qualify them for such a duty; men who do not know anything about the qualities of cheese or of proper business methods, and it is not surprising that they sometimes get the worst of the bargain. Salesmen of this kind are a positive barrier to progress and they have cost the patrons of cheese factories of this province a great deal of money, both directly and indirectly. When such a man offers inferior cheese for sale, he will not be convinced of the fact like a man who really knows something about cheese. He assumes that he is being imposed upon instead of finding out the cause of the defects and having it removed. Thus the evil is perpetrated and the losses go on. If the matter is in the hands of a capable man, he will find out where the trouble is and seek to have it remedied.

MIDDLEMEN NECESSARY.

I believe the middleman is a necessary factor in the successful handling of the Canadian dairy produce trade. In the marketing of cheese, its distribution to the different centres in Great Britain calls for special knowledge, because these different places demand cheese of widely different character. It is a well known fact that cheese which will give satisfaction in the Manchester market are not wanted in London. The same may be said of Glasgow, Liverpool and other points, all of which have their peculiar fancies. It is here, in dealing with these special requirements, that the training and experience of the middleman is useful in realizing full value for different kinds of cheese.

Then there is another very important consideration. Canadian cheese amounts to between 70 and 80 per cent of the total imported into Great Britain. The consumption of cheese goes on throughout the year, but the manufacture in Canada, as every one knows, does not extend over a period of more than about seven months. The result is that as the season advances the surplus of supply over demand gradually

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increases. The middleman speculates with this and holds it until such time as it may be required for consumption. It must be very plain to any one that if all our cheese were forced on the English market, as it would be on a consignment basis, as soon as it is made, the market would be demoralized before the end of the season. It is safe to say that if every box of cheese made in Canada this year had been consigned to Great Britain within three or four weeks after it was made, cheese would now be selling for a very much lower price than it is. Without the middleman or exporter we would lose the advantage of the competition for the cheese, which often raises the price higher here than it is in England.

DAIRY INSTRUCTION.

Now, Mr. President, there are many other things which I might discuss, but this paper is already long enough. I cannot close, however, without mentioning one feature of the dairy situation in Eastern Ontario, concerning which there is good reason for congratulation. I refer to the work of dairy instruction. The dairy associations of Ontario are entitled to the credit of having inaugurated a scheme for dairy improvement when they first employed instructors to visit the factories, which has since been adopted in some measure by every important dairying country in the world. It was exactly thirty years ago this coming season that the western association employed the late Prof. L. B. Arnold, of the State of New York, to introduce his new method of cheesemaking, which was known as the 'sweet' curd system to distinguish it from the so-called 'acid' system then in vogue. Mr. J. B. Harris, of Antwerp, N.Y., was engaged by your association in 1881, and the two following seasons, to visit the factories in Eastern Ontario. After that, Canadian instructors were employed, and it should be a matter of pride to us all that it has never since been thought necessary to go outside of the province for dairy teachers, and what is even more complimentary, the United States, New Zealand, Australian and Scottish authorities have induced many of our best men to accept service in those countries. The dairy instructors never had a fair chance until they were made independent of the factories as they are at present. The value of the instructors' work has been increased enormously by the aggressiveness and fearlessness engendered of freedom. It is gratifying to find these men taking their places as leaders in their respective localities. The successful instructor must possess other qualities in addition to technical skill of a high order. He must be tactful, patient and persistent, as well as industrious. A blustering, grouching, fault-finding manner destroys the effectiveness of any man's skill in this kind of work, because the Canadian temperament calls for a leader, not a driver.

It has always appeared to me that there should be a little more organization in connection with the different instructional districts, but as long as the matter is under the energetic and capable supervision of Mr. Publow, we have an assurance that the work will be well done. As a last word, let me say that this scheme of dairy instruction should have the hearty support of every Ontario dairyman, for it has put millions of money into the pockets of the milk producers.

(Dairymen's Association of Western Ontario,
Brantford, January 14, 1909.)

A GENERAL SURVEY OF THE DAIRY INDUSTRY FROM A CANADIAN STANDPOINT.

By J. A. Ruddick, Dairy and Cold Storage Commissioner.

When considering a choice of subjects for an address at this convention, it occurred to me that 'A General Survey of the Dairy Industry from a Canadian Standpoint' should be of interest, in view of the important developments which are now taking place in various parts of the dairy world, some of which may have a very



The Hon. Thomas B. [unclear]



Harvey Farrington, who started the first cheese factory in Canada, in Oxford County, Ont., in 1864.

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decided influence on the future of the Canadian dairy industry. We must keep our eyes open to what is going on around us and study the march of progress in other countries if we would be fully prepared to face the competition which we are likely to meet in the world's markets. In these days of rapid and safe transportation the four corners of the earth are brought into direct contact, and distance and cost of carriage no longer stand as obstacles in the way of the free movement of dairy produce from one point to another in times of local scarcity or over supply. Any one who would have suggested sending Canadian butter to Australia or bringing it to Canada from New Zealand or Siberia, would have been considered mad not so very long ago; and yet, that is what has actually been done during the last year or two. Extended commercial organization is also a factor in promoting the trade in butter and cheese between different countries, and we have amongst us representatives of houses whose ramifications extend from that great centre of consumption, Great Britain, to every important field of production in the world.

One of the notable features of the dairy produce trade during the past ten years, has been the large increase in butter consumption in Great Britain and in Germany. A few years ago Germany was an exporter of butter to a large extent; but that is a thing of the past. The improved condition of the industrial classes in Germany enables many of the people to use butter, who a few years ago did not know the taste of it. This increased home demand has absorbed the whole production of the country and calls for a large importation from abroad. The annual importation of butter into Germany now amounts to something like 100,000,000 pounds, which comes principally from Denmark, Holland and Russia. If we are to take any note of competition or the absence of it, we must recognize that this German demand is of real interest to us, because, lacking that outlet, practically all the butter which now goes there would be dumped into England, with what result it is hard to say; but it certainly would not improve the tone of the market. It is true that our export of butter to England has grown so small as to cease to be of much importance in itself; but I look upon butter and cheese as so closely related that they should always be considered together. Conditions of production are such in many places, that an over production and reduced price of one article immediately result in an increased production of the other.

INTERNATIONAL TRADE IN BUTTER.

Looking over the field of international trade in butter, the first point to note is that the consumption of butter in Great Britain—which country is by far the largest importer of this product—has increased at a very rapid rate for some years past. The imports for the year ending June 30, 1908, exceeded those of 1899 by 81,753,520 pounds, and as the home production in Great Britain does not change much from year to year, this large increase may be attributed to increased consumption. As for the exports by countries, we are naturally attracted first to Denmark, with an annual export of about 200,000,000 pounds, and nearly double that of any other country. The story of Denmark's butter trade is so familiar that it needs no more than passing mention, especially as there is no evidence to show that there will be much change in the volume of Danish exports in the immediate future. The Russian or Siberian export of butter is now easily second to Danish in volume, and it is growing rapidly; but I shall refer to it later on. Australia in times of plenty, that is to say when there is sufficient rain, ranks third in the list; but the supply of butter from the Commonwealth will always be a little uncertain because of weather conditions. For instance, in 1902, Australia exported only 7,777,971 pounds of butter owing to the prolonged drought; but such are the marvellous recuperative powers of the country that in 1904, after good rainfall, the quantity had risen to 64,788,542 pounds. Holland takes fourth place with a steady export of about 50,000,000 pounds a year. As the Dutch co-operative associations, when they build a new creamery, borrow the money

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and arrange the repayments to cover a period of fifty years, it would seem to be a reasonable inference that they intend to keep right on making butter. History tells us that it takes strong influences to swerve the Dutch from a course which they have once decided upon.

New Zealand, Finland, France and Sweden each export between 30,000,000 and 40,000,000 pounds a year; but New Zealand is probably the only one of these countries which is likely to show an increase in the future. Nor is it probable that there will be much change in either direction in the older countries.

At one time we were told that Argentina was the coming country in the butter trade; but its arrival seems to have been delayed. As a matter of fact, there has been no increase in the shipments of Argentine butter since 1902, and those who know the country, while admitting its suitability for dairying, say that the present inhabitants will never become dairymen on a large scale.

THE SIBERIAN COMPETITION.

Possibly the most interesting, because it promises to be the most serious, competition which some countries will have to meet, comes from Siberia. The building of the Trans-Siberian Railway has opened up an enormous territory which is apparently better suited for live stock industries than for other lines of farming. Owing to the existence of numerous navigable waterways which cross the railway at right angles and act as feeders to it both from the north and from the south, the extent of country which has been given communication is many times greater than would ordinarily be served by a single line of rails.

The first butter was exported from Siberia in 1894, and the quantity was only 14,400 pounds. It is stated that the quantity exported in 1908 was about 135,000,000 pounds. The principal growth has been in quite recent years. The development of Siberia as a dairying country is due to the remarkable migration of peasants from European Russia. The *Pall Mall Gazette* of London, is my authority for the following figures: 'Up to the end of 1905, the average annual migration across the Urals was about 60,000 persons. In 1906, this number was increased to 180,000; in 1907, the total was nearly 500,000; while in the first three months of 1908, 70,000 families, or approximately 420,000 persons, settled in Siberia.' If you imagine the present settlement of the prairie provinces of Canada as progressing at two or three times the present rate, you will have some idea of what is going on in Siberia.

In one respect the Siberian competition is not as serious as it might be, for in spite of the skill of Danish buttermakers, who are largely employed, the quality of the great bulk of the product is only second grade, owing to the unsanitary conditions under which the milk is produced. The people are yet extremely poor, with primitive surroundings, and a high standard of cleanliness is not to be expected in such circumstances. On the other hand, these very conditions will permit the Siberian farmer to continue the production of butter at a rate which would be ruinous to Canadian or other English speaking farmers with their higher scale of living. Our safety lies in bringing to our dairy operations the advantages which a more advanced civilization gives us in producing a superior article, and increasing the flow of milk by improving our dairy herds.

INTERNATIONAL TRADE IN CHEESE.

Turning now to the cheese branch of the dairy industry, we are confronted with another set of conditions. In the first place, the total consumption of cheese in Great Britain, almost our sole market abroad, has not permanently increased in ten years, nor is there any evidence that it will do so in the future. Our chief hope for an increased outlet at present prices, apart from what may be gained by improved quality, seems to lie in the encouragement of a greater consumption in Canada, in which direction there are greater possibilities than are generally supposed. Canadians take some pride in the fact that they are by far the largest exporters of cheese in the

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world. The country next in the list, which is Holland, has a little over half as much to her credit. Or, in other words, Canada will this year export about 170,000,000 pounds of cheese, while the Dutch exports are only 100,000,000. Moreover, only about one-third of Holland's trade is with England. Add to this fact that the Dutch cheese are of a different variety from ours, and go largely to markets for which our cheese are not suited, and it will be seen that the competition either directly or indirectly is not as keen as it would be if the cheese were of the same kind as ours.

Switzerland is the next largest cheese exporting country; but as only a very small percentage of the Swiss cheese reaches the British market and the whole of it is different in character from the Canadian, we need not concern ourselves very much with it at present. The Italian export, consisting largely of Gorgonzola cheese, follows next in order of quantity. Although the Italian output seems to be increasing somewhat, it does not, on account of its character, compete directly with Canadian. It would be a mistake, however, to assume that there is no competition between cheese of different varieties, or that one kind is not often substituted for another.

The United States, although still the greatest cheese producing country in the world, and at one time Canada's most formidable rival in the British market, has ceased to be a factor in the international trade in cheese, because practically the whole output is required for home consumption.

The English and Scotch cheese, consisting chiefly of Cheddar or allied varieties, though not exported, is for that very reason of great importance in the British market, especially as the quantity produced far exceeds the Canadian output or that of any other country except the United States. There are no accurate statistics of the production of cheese in Great Britain, but it is estimated to be at least 300,000,000 pounds a year.

NEW ZEALAND.

Last, but not least, we have to consider a country which is reaching out for a share of England's cheese trade with an aggressiveness, and with a measure of success, which should cause Canadian dairymen to do some thinking. I refer to New Zealand, our only direct competitor of any consequence, in the import trade of Great Britain. New Zealand cheese are of the same type as ours, and the cheesemakers receive their instructions from a Canadian teacher. Previous to 1906 the production of cheese in New Zealand had not shown any permanent increase in ten years; but since that year there has been a remarkable expansion, and the present season's output, which is expected to be at least 400,000 boxes, or probably 35,000,000 pounds, will be about three times as large as that of 1906. This sudden growth is due largely to the fact that the combined factories have turned their milk into cheese instead of butter, owing to the higher returns from cheesemaking. Should the relative price of butter and cheese be reversed, the production of cheese will be almost sure to fall back nearly to its old level; but if the market continues as it has been lately, there will likely be a considerable increase in the quantity of cheese manufactured for some time to come. It is hard to say how much it may increase, because the country is capable of producing an enormous quantity of dairy produce, and large areas are not well adapted for anything else. Fortunately for us, dairying is not popular as an occupation among the settlers; they prefer sheep farming. Dairying is, however, the most profitable branch of farming on small holdings in New Zealand.

While the quantity of New Zealand cheese is not yet large enough to prove a very serious menace in view of our decreased shipments, there are some features of this competition which should command our attention. In the first place the New Zealand cheese factories are larger than ours, some of them making as many as 140 cheese a day. This tends to give the output a uniformity of character and quality which cannot be so easily attained in small factories. In the second place the cheese are all practically cool-cured, because the weather is never as hot as it is in Canada. Owing to the distance from the market, the cheese are at least two months old before

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they reach the consumer, and as they have to cross the equator in transit, they must be carried in cool storage which ensures their delivery in cool condition. Moreover, as they land in England only during cool weather, they do not suffer from exposure to heat after reaching the market, as ours sometimes do. It is generally understood, I suppose, that the New Zealand season is exactly opposite ours. Their summer is our winter. The season there is longer than it is in Canada, owing to the absence of any real winter, so that the first of the season's make arrives about the beginning of December, continuing all through the winter until the month of June.

Now, here is where the most serious part of the competition comes in. The supply of Canadian cheese during the manufacturing season exceeds the demand, as every one knows, and British merchants stock up with the surplus against the period of non-production. When Canadian cheese was practically the only cheese of its kind being imported, they were obliged to do this or go without. But with the New Zealand supply in view, the merchant is not so keen in placing his orders, especially if the quality of the Canadian cheese does not suit his fancy, or if he thinks the price is too high. In this way the New Zealand cheese have a sentimental as well as a material effect on the market, out of proportion to the quantity offered.

Drawing on my personal knowledge of conditions in New Zealand as well as in Canada, I would say that the alarm expressed in some quarters concerning the New Zealand competition may yet be justified if Canadians do not make the best use of their opportunities. First and always I would urge every factory to provide for the cool curing of their cheese. The presence on the market of so many cool-cured cheese from New Zealand, will emphasize the superiority of mild flavoured cheese. I cannot go into the question of cool curing now, nor would it appear to be necessary. There are a sufficient number of cool curing rooms in Canada to furnish evidence of the advantages to be derived from them, and if any one wishes to know the experience of those who have them, he need only make inquiries. I would like to impress this point, however: when estimating the benefit to be derived from cool curing, do not forget to take into account the important effect it will have on the future of the industry.

To finish this general or foreign part of our survey of the dairy industry, I submit the following tables of exports of butter and cheese from various countries, compiled in part from the Year Book of the United States Department of Agriculture, and partly from other sources.

TABLE I—INTERNATIONAL TRADE IN BUTTER, 1906.

| Country. | Exports. | Imports. |
|----------------------------|-------------|-------------|
| | Lbs. | Lbs. |
| Denmark | 175,043,639 | 13,049,168 |
| Russia (Siberia) | 114,369,238 | 577,805 |
| Australia | 75,765,536 | 70,143 |
| Holland | 56,404,861 | 563,865 |
| France | 39,307,325 | 11,402,808 |
| New Zealand | 35,865,200 | |
| Sweden | 35,713,817 | 1,316,117 |
| Finland | 33,192,114 | |
| Canada | 18,243,740 | |
| United States | 12,544,777 | |
| Italy | 10,746,430 | |
| Argentina | 9,712,076 | |
| Austria-Hungary | 7,740,648 | |
| Belgium | 3,704,232 | 11,128,520 |
| Norway | 3,281,403 | |
| Brazil | | 5,344,412 |
| South Africa | | 11,555,202 |
| Germany | | 80,896,179 |
| Great Britain | | 477,092,448 |
| Other countries | 4,677,661 | |
| | 626,311,697 | 612,996,657 |

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TABLE II—INTERNATIONAL TRADE IN CHEESE.
EXPORTS, 1906.

| Country. | Variety of Cheese. | Pounds. |
|-----------------------|--------------------|-------------|
| Canada | Cheddar | 200,824,470 |
| Holland | Edam & Gouda..... | 104,742,665 |
| Switzerland | Gruyere | 61,935,107 |
| Italy | Emmentaler | 42,314,633 |
| France | St. Emmenten | 22,058,487 |
| United States | Cheddar..... | 17,285,230 |
| New Zealand | " | 11,025,072 |
| Belgium | Various | 6,003,741 |
| Germany..... | " | 2,629,673 |
| Russia | " | 1,733,414 |
| Other countries. | " | 9,111,773 |
| | | 483,937,265 |

IMPORTS, 1906.

| Country. | Pounds. |
|----------------------|-------------|
| Argentina | 7,304,669 |
| Australia | 306,951 |
| Austria-Hungary..... | 8,935,994 |
| Belgium..... | 30,333,690 |
| Brazil | 3,784,774 |
| South Africa | 3,228,593 |
| Cuba | 4,078,517 |
| Denmark | 1,782,437 |
| Egypt | 10,064,909 |
| France | 44,714,972 |
| Germany | 48,187,525 |
| Italy | 10,398,761 |
| Spain | 4,255,835 |
| Switzerland | 5,511,979 |
| Great Britain | 289,371,824 |
| United States | 33,848,706 |
| Total | 506,138,196 |

These figures will serve as a comparison. I have not been able to get complete statistics of years later than 1906. As far as cheese is concerned, the only countries in which there has been any material change in 1907 and 1908 are Canada, United States and New Zealand, the two former showing a decrease and the latter an increase, as we have already indicated. With respect to butter, Siberian exports have been largely increased. Australian increased in 1907, but fell off again in 1908. New Zealand and Canadian exports have also shown small increases. Of course it will be understood that the exports of a country do not bear any regular relation to production. That depends on home consumption, as we have seen in the case of Great Britain and of the United States. I have given you the export figures, because those of production are not available and would not be so interesting or instructive if they were.

THE DAIRY INDUSTRY IN CANADA.

Having completed this somewhat rapid survey of the international trade in butter and cheese, I ask your attention now for a moment to some aspects of the industry in Canada.

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Our exports of butter reached the maximum of 34,128,944 pounds in 1903, and then declined to less than 4,000,000 pounds in 1907. The figures for 1908 will show an increase of probably one and a half million pounds, over 1907.

Canadian cheese exports reached the maximum of 233,980,716 pounds in 1904, and they also have declined. It is estimated that the exports for the season of 1908 will not be over 170,000,000 pounds, making a total shrinkage of nearly 800,000 boxes of eighty pounds each since 1904.

CAUSE OF DECLINE IN EXPORTS.

This rather startling decrease in the export of Canadian dairy produce has been looked upon in some quarters as an actual decline of the industry in this country. I do not think that view of the matter is justified if we consider all the facts which bear on the question. In the first place the seasons of 1907 and 1908 were extremely unfavourable for the production of milk in the principal dairying districts, while on the other hand the seasons of 1903 and 1904 were quite the reverse. The increase in the condensed milk industry has also had an appreciable effect on cheese and butter production, but the main reason for the decrease in the exports is to be found in the increased home consumption.

INCREASED HOME CONSUMPTION.

As it appears to me, there are three factors which have contributed to this increase. First, there is the growth of population. There are probably 1,000,000 more people in Canada at the present moment than there were in 1904. I should say that that number of people would consume at least 20,000,000 pounds of butter, and milk and cheese equal to another ten million pounds. Then there is the increased purchasing power of the people as a whole, which permits them to spread the butter more thickly and to indulge to a greater extent in the use of cream, ice cream and other milk products. Last, but probably not least, the improvement in the quality of butter has encouraged a tremendous increase in its general consumption. Taking all three factors together, I think it is safe to say the falling off in exports is fully equalled by the increase in home consumption.

HOME TRADE IMPORTANT.

I see no reason whatever to deplore the fact of our decreased exports. On the contrary, we have every reason to congratulate ourselves that we have found another outlet in the enlarged home market. It must be apparent to any one who has given the matter a thought, that if we had continued to ship as much cheese of the same quality to Great Britain as we did in 1904, the market would have been overdone and more or less demoralized. In any case, the present level of prices could hardly have been maintained. The lesson for us is that we should give more attention to our home trade, which has always been of more importance than we have generally recognized. I have only to state that we consume in Canada in the shape of milk, butter, cheese and condensed milk over two-thirds of our total dairy production, to prove how important it is, and in doing so, I submit a fact which has been generally overlooked. We can, I believe, increase the consumption of cheese in Canada to a large extent by giving it to the people in convenient form, of the right character and quality and properly matured. There is an enormous demand for cheese in Canada which is not satisfied.

By improving the quality and lessening the proportion of heated, strong flavoured cheese, the consumption would be increased in Great Britain also.

I do not want any one to think that I regard the old country market as unable to take a larger quantity of our butter and cheese than it did last year. I believe there might be a much larger share of Great Britain's requirements in dairy produce

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supplied by Canada if care were taken to send goods of the right quality, and the kind which will encourage consumption. We have this satisfaction, that the old country will give us the preference over continental countries, everything else being equal.

There is no reason why there should not be a large expansion of the dairy industry in every province of Canada as well as in Ontario. I hope the movement for the improvement of dairy herds will help in that direction, even if new territory is not opened up.

Perhaps one of the best arguments that can be used in favour of dairying as a profitable branch of farming is to point to those districts or counties where it has been most extensively followed, for there you will find the most prosperous farming communities.

CONDENSED MILK.

There has been some growth of the condensed milk industry in Canada during the past two years.

The following factories are now in operation:—

- The Truro Condensed Milk Co., Truro, N.S.
- The Canada Milk Condensing Co., Antigonish, N.S.
- The St. Charles Condensing Co., Ingersoll, Ont.
- Canadian Milk Products, (Milk Powder), Brownsville, Ont.
- Condensed Milk Co., Limited., Charlottetown, P.E.I.
- The Truro Condensed Milk Co., Huntingdon, Que.
- The Sweet Milk Condensing Co., St. Lin, Que.
- The Canadian Condensing Co., Limited, Chesterville, Ont.
- The Aylmer Condensed Milk Co., Aylmer, Ont.
- The Canadian Condensed Milk Co., Hamilton, Ont.
- Borden's Condensed Milk Co., Tillsonburg, Ont.

SOME FIGURES OF INTERNATIONAL TRADE IN CONDENSED MILK.

| | 1904 | 1905 | 1906 | 1907 | 1908 |
|---|-----------|-----------|-----------|-----------|-----------|
| | \$ | \$ | \$ | \$ | \$ |
| Canada - | | | | | |
| Imports..... | 8,805 | 6,261 | 7,816 | 26,225 | 124,342 |
| Exports..... | 189,771 | 203,149 | 83,000 | 15,583 | 79,353 |
| United States | | | | | |
| Imports..... | 21,040 | 18,596 | 5,634 | | |
| Exports..... | 1,849,513 | 1,953,512 | 1,889,795 | 2,548,435 | 1,997,689 |
| United Kingdom— | | | | | |
| Imports..... | 7,951,003 | 7,897,572 | 7,697,813 | 7,863,339 | 7,823,282 |
| Exports, Home Manufacture | 2,955,314 | 2,881,508 | 3,236,284 | 3,452,835 | |
| Exports, Foreign and Colonial Manu- facture..... | 908,803 | 969,258 | 767,792 | 375,505 | 403,265 |
| Exports, Total..... | 3,864,077 | 3,850,766 | 4,004,076 | 3,833,340 | |
| Switzerland— | | | | | |
| Exports..... | 5,843,400 | 5,718,000 | 5,765,600 | 6,288,995 | |

* No returns.

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VALUE of Condensed Milk Exported from Switzerland to Different Countries during the year 1907.

| | | | |
|--------------------------------|-----------|-------------------------------|-------------|
| Africa, South.. .. . | \$ 16,914 | Greece.. .. . | 11,353 |
| Africa, Other.. .. . | 86,684 | Holland.. .. . | 2,270 |
| Algeria and Tunisia.. .. . | 58,343 | Italy.. .. . | 18,727 |
| Argentine Republic.. .. . | 27,062 | Japan.. .. . | 136,503 |
| Austria-Hungary.. .. . | 3,387 | Mexico | 36,867 |
| Australia.. .. . | 93,159 | Norway.. .. . | 151 |
| Belgium.. .. . | 13,763 | Persia and Afghanistan.. .. . | 14 |
| Brazil.. .. . | 493,567 | Philippines.. .. . | 46,106 |
| British India.. .. . | 677,662 | Portugal.. .. . | 3,931 |
| Bulgaria and Servia.. .. . | 60 | Russia.. .. . | 6,593 |
| Canada.. .. . | 1,594 | Siam and Indo-China.. .. . | 116,146 |
| Central American States.. .. . | 283,265 | South America, other.. .. . | 40,043 |
| Chili.. .. . | 74,158 | Spain.. .. . | 252,839 |
| China.. .. . | 23,206 | Turkey in Asia.. .. . | 5,081 |
| Colombia.. .. . | 2,241 | Turkey in Europe.. .. . | 9,615 |
| Dutch East Indies.. .. . | 250,036 | United States.. .. . | 3,981 |
| Egypt | 32,145 | Other Countries.. .. . | 62,038 |
| France.. .. . | 82,738 | | |
| Germany | 21,168 | | |
| Great Britain.. .. . | 3,295,030 | Total Exports.. .. . | \$6,288,995 |

The United States is a large producer of condensed milk. The value of the total output in that country in 1905 (last census of manufactures) was \$20,149,282.

A large quantity is manufactured in Ireland and in various continental countries of which Switzerland is the chief producer.

The value of the annual output in Canada is now well over \$1,000,000.

CANADIAN DAIRY PRODUCE AT THE FRANCO-BRITISH EXHIBITION, LONDON.

Canadian dairymen will be interested in the reproductions of the ‘Butter Statuary’ (Plate XX) which formed such an attractive feature of the Canadian section of the Franco-British Exhibition. The success which attended the exhibition of the ‘Mammoth Cheese’ from Canada (weight 22,000 pounds) at the Chicago World’s Fair in 1893 was repeated in a somewhat different way. The following reference to the exhibit is taken from *The Daily Telegraph*, London, of June 18, 1908:—

SCULPTURE IN BUTTER.

‘An exhibit sure to attract much attention is that which is intended to depict the extent and value of Canada’s output of dairy produce, and of that exhibit no portion will probably have so many eyes riveted upon it as the groups of sculpture executed in Canadian butter. Wonderfully artistic are these pieces of ‘sculpture in butter.’ One group depicts the recent meeting of His Majesty and M. Fallières. Both figures, moulded to life-size, are wonderfully accurate presentments of King and President—that of M. Fallières being particularly life-like. The other group represents the landing of Jacques Cartier at Quebec in 1534, and his meeting with the Indian chief, Donnacona. Here again the figures seem remarkably natural in pose and feature. Cartier, in the costume of the period, stands in the stern of a boat; the chief is greeting him from the shore. Not only the figures, but the boat and the entire surroundings are beautifully modelled. How the butter is kept cool in the heat of summer is a question which will doubtless occur to the majority of spectators who admire the exhibit. The little gas engine which is hard at work on the farther side of the show-case supplies the answer. The engine is operating the refrigerating apparatus which prevents the sun’s rays from playing havoc with the sculptor’s handiwork.’

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REPORT OF THE ACTING OFFICIAL REFEREE FOR BUTTER AND
CHEESE AT MONTREAL

MONTREAL, Que., December 11, 1908.

J. A. RUDDICK,
Dairy and Cold Storage Commissioner,
Ottawa.

SIR,—I beg to present my report as acting official referee of butter and cheese at Montreal, for the season of 1908.

I examined and gave certificates on 115 lots of cheese containing 5,486 packages, and 40 lots of butter containing 1,540 packages. I also examined a few lots of cheese without orders from the salesmen and reported on the quality to Mr. G. G. Publow, Chief Dairy Instructor for Eastern Ontario.

I found 13 per cent of the cheese which I was requested to examine to be first grade; 81 per cent second grade and about 6 per cent third grade and culls.

MOST COMMON DEFECTS IN CHEESE.

The chief defects in the second and third grade cheese were as follows: 85 per cent of the lots had one or more 'batches' not clean in flavour, referred to in the certificates as 'not clean,' 'fruity,' 'off flavour,' 'yeasty,' 'gassy,' 'rancid,' 'sour milk' and 'feed flavour'; 50 per cent included batches open or loose in texture; 33 per cent had too much moisture; 23 per cent 'acidic' and 'mealy'; 8 per cent acidic and too soft; 20 per cent uneven or too pale in colour; and 29 per cent uneven in size, or with stained ends and poor finish.

Objectionable flavours are the most serious defects and they are, no doubt, largely due to the condition of the milk when delivered to the factories. Then some of the lots had too much moisture, which would make these flavours more pronounced, especially in fruity and off flavoured cheese. A small percentage is referred to as of 'sour milk' flavour, which seemed to be caused by strong flavoured starters, while 3 per cent were described as feed flavours.

I frequently found that when a lot was open and loose one or two batches showed sweet holes, and I judge from this that some of the makers were running their curds a little on the sweet side. Salting the curds too soon seemed to be one of the main causes of this defect.

CAUSES OF DEFECTS.

After the 15th of September, many of the lots were soft and pasty or contained too much moisture, indicating that the curds had not been sufficiently cooked or stirred dry enough. I suppose one of the main reasons for this was the scarcity of water, which would decrease the milk supply and increase the fat, making it necessary to give the curds a more thorough cooking. Then we have acidic and mealy texture with pale colour, which are rather common defects in the hot weather. There were also a few lots with a dry, rough texture, or cheese that seemed to be lacking in fat, showing over cooking and heavy salting. Later on in the season, we had acidic and moist cheese. I can understand that acidic and mealy texture might be due to overripe milk and heavy salting, but this latter defect seemed to be caused by bad management in the making. On the whole, the finish of Ontario cheese was fairly good. There were a few lots with stained and checked ends and during the fall some of the cheese did not seem to have been turned in the hoops in the morning. A few lots were uneven and undersized, and I generally found that these small cheese had too much bandage over the ends, with the boxes considerably higher than the cheese. If the boxes are large enough, the cheese should be made to weigh between 80 and 85 pounds. The weight should be put on neatly with a stencil near the lower band and close to the lap on the box.

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BUTTER.

I found 32 per cent of the butter examined to be first grade and 68 per cent second grade. The chief defects were in the flavour and colour. Nearly 90 per cent of the lots had one or more churnings not clean in flavour and about half of these could be described as having an old cream or an overripe cream flavour. Forty per cent of the lots contained packages which were either mottled, cloudy or irregular in colour. A small percentage of the lots were greasy during the hot weather, showing high temperatures in churning and working. Nineteen per cent were not finished neatly and a few lots had mould on the parchment paper.

PACKAGES SHOULD BE NUMBERED.

At the Eastern Ontario Dairymen's Convention last year, Mr. Geo. H. Barr referred to the system of inspection in the warehouses and recommended a system of numbering the different batches of cheese and churnings of butter. He stated that the present system of selecting a small percentage of packages from a shipment and judging the quality of the whole lot by these samples was not in the best interests of the trade and did not seem to be fair either to the buyer or the seller. I quite agree with this, for I believe that many lots are passed which contain some packages not up to the standard, while on the other hand, whole shipments are turned down or objected to when only one or two batches are not right. The inspector cannot tell whether he has a fair representation or not, and personally, I think it is one of the most unsatisfactory jobs I ever tackled to attempt to give a fair report on the quality of 50 or 100 boxes of cheese by examining eight or ten packages when the only marks on the cheese or boxes are the factory brand and the weight. If the different batches were numbered one could see a sample of the whole make and give a correct report on the quality, and if the percentage of faulty packages was not too great, these could be picked out and the cut in price made only on those of inferior quality. I regret to say that the cheesemakers did not seem to take advantage of this system, because only four out of the 115 lots had the boxes numbered and such a high percentage of these were faulty, varying from 69 to 100 per cent, that I was obliged to class them as second grade.

But let me give you the experience of the buttermakers. Eighteen per cent of the forty lots examined, or 32 per cent of the total packages, were numbered. Now, 70 per cent of these and only 12 per cent of the unnumbered packages were classed as first grade, which should be sufficient evidence that numbering the packages is a great advantage and that it rests with the butter and cheese makers to put the system on a more satisfactory basis.

I do not know any reason why it should not be just as great an advantage to have the batches of cheese numbered. As a matter of fact, only three lots of cheese were classed as straight first grade, but by picking out one and two batches in twelve lots it raised the percentage of first grade cheese to 13 per cent of the total. Some of these lots had the dates on the cheese and by taking the boxes off the cheese, I was able to see a fairly representative sample of the lot.

In dating the cheese, it would be much better to put the date on the end. Then it would not be necessary to take the boxes off to look for the distinguishing mark. But the only proper way is to number the boxes, and it should not take a great deal of time if one has a set of one-half or three-quarter inch rubber stamps. If there are two vats, number the first day's make 1 and 2, and the next day's 3 and 4, and so on until the end of the week. It is only by adopting such a system as this that you can expect to get an accurate report on the quality, and it should put the system of inspection at Montreal on a basis which would be fair to all parties concerned.

SUGGESTIONS.

In closing, I want to suggest that a change be made in a clause in the standards for grading cheese and butter, which reads as follows:—

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'If there are not more than 15 per cent of defective cheese in any lot, the inferior ones may be sorted out and classed separately. If more than 15 per cent are defective, the classification may apply to the whole lot.'

Now, 85 per cent of the lots I examined contained under 49 boxes. If one cheese in the samples was faulty, it meant that one batch was wrong which would be more than 15 per cent of the total, and I would suggest that 15 be changed to 17, which would allow for one batch being defective. In cases where cheese are numbered or dated on the ends, so that the different batches can be picked out by taking the covers off the boxes, I think this percentage should be increased to allow for two batches being defective.

JOSEPH BURGESS,

Acting Official Referee of Butter and Cheese.

An officer of this branch has been stationed at Montreal as official referee every year since 1900, with the exception of 1906. The demand for the services of such an official appears to be growing less and the number of examinations made in 1908 were so small that a continuance of the office can hardly be justified.

IDENTIFICATION MARKS ON CHEESE AND BUTTER.

Every officer who has filled the position of official referee has drawn attention to the importance of marking cheese and butter packages, so that 'batches' or churnings could be sorted. It has been shown in the clearest possible manner that such a system if adopted, is greatly to the advantage of the factory, and yet Mr. Burgess' report shows how few take the trouble to carry it out. If factorymen are so indifferent to their own interests, they have very little ground for complaint if they occasionally get the worst end of the bargain.

THE OUTLOOK FOR CANADIAN DAIRYING.

With a rapidly growing home market, a steady demand in Great Britain, and the constantly increasing importation of dairy produce by Germany (page 17), the outlook for Canadian dairying is as good as, if not better than it ever has been in the past.

The Canadian export dairy trade appears to be threatened only in one quarter, namely, by the increasing exports of cheese from New Zealand to Great Britain. The extent to which the Canadian industry may suffer from this competition will depend to a large extent, as has been shown elsewhere, (page 13) on the efforts which are made by Canadian cheese producers to meet it.

A somewhat pessimistic view of the dairy situation has been held in some quarters during the past year and the large decrease in the exports of butter and cheese since 1904 is put forward in justification. If we take into account the great increase in home consumption and the fact that the seasons of 1907 and 1908 were exceptionally unfavourable for the production of milk in the principal dairying districts, there is no real reason for believing that there is any general decline in the industry. Two unfavourable seasons coming together had a more serious result on production than if one or more average or good years had intervened. Further, the record years of 1903 and 1904 were two exceptionally favourable years, which resulted in the other extreme.

The dairy industry of Canada, but more particularly of Ontario, is concentrated around certain well recognized and clearly defined centres. As the distance is increased from these centres, one finds the dairying territory merging into that of special fruit growing, or beef and corn raising districts, so that there is always a sort of border land, between the dairying districts and the other districts, where the

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farmers are more or less undecided between different pursuits, and it takes very little to influence these people one way or the other.

If one looks back over the history of dairying in Ontario, he will find that these undecided areas, if one may use that term, have their periods of ups and downs in dairying, but if the situation is examined at or near the centre of these districts, it will be found that there is not the slightest intention of giving up dairying in any way, but that the production of milk continues to increase as a result of better methods of feeding and more attention being paid to the improvement of dairy cows. There never was a time in the history of dairying in Canada when a keener interest was being displayed in all matters relating to the improvement of the dairy industry, and that is the best possible sign of a healthy condition. The increased use of milk and the growth of the condensed milk industry is having a considerable effect on the production of cheese and butter.

THE AERATION OF MILK FOR CHEESEMAKING.

Twenty to thirty years ago there was no point in the whole range of discussion bearing on the manufacture of cheese which received more attention than the aeration of milk. Speakers at dairy meetings and writers on dairy topics insisted on the general adoption of the practice, and official bulletins contained similar advice. Inventors seized upon the idea, and as a result, numerous utensils designed to facilitate the aeration of milk were soon offered to patrons of cheese factories. They were almost forced upon them by many well meaning factory managers. As has happened in other cases, the irresponsible agent for the sale of aerators, with his persuasive tongue and indifference to accuracy of statement, assisted very materially in spreading what must now be looked upon, in the light of experience and investigation, as something of the nature of a popular fallacy.

It is rather surprising when one comes to look into the question to find a complete lack of authority, based on accurate knowledge, to warrant the advocacy of the practice of aeration. We must, however, take into consideration one or two circumstances affecting the situation at that time. In the first place, the role of bacteria in the changes which take place in milk, and in the development of cheese and butter flavours, good or bad, was not so well understood twenty-five years ago as it is now. In the second place, the intelligent use of the fermentation starter was almost unknown in those days. The cheesemaker found when the milk was received at the factory 'too sweet' as the result of cooling, that the time required for 'ripening' was a great disadvantage. The slight cooling which aeration alone affected was in most cases sufficient to preserve the milk, but in a more advanced stage of acidity, and the process of cheesemaking was hastened accordingly. The cheesemaker then became an advocate of aeration. The advance in the art of cheesemaking and improved methods of handling milk on the farm, coming with the adoption of aeration, may probably have strengthened the belief that aeration was in some way beneficial. There is good reason to believe, however, that aeration is of no benefit to milk intended for cheesemaking, except insofar as it reduces the temperature. There is also this important consideration that aeration is least effective in the matter of cooling on the occasions when cooling is most needed. The extent of the cooling by aeration depends on the temperature of the air and it follows that there is the least cooling in the hottest weather, although that is the time when the lowest temperatures are required. While there may have been some doubts in the past, we are now in a position to declare that exposure of the milk to the air in any manner, either by running it over an aerator, or by pouring or dipping under average farm conditions, is positively harmful.

Before proceeding to describe the experiments, the results of which compel us to adopt the foregoing view, it may be well to refer briefly to the change of opinion which has already taken place regarding the benefits of aeration.

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It has always been pointed out that milk should be aerated only in a 'pure' atmosphere, which is undoubtedly good advice if it could be followed literally. If such a thing was possible, the whole question of aeration might assume a different aspect from what it does. We are compelled, in the light of teaching of bacteriology, however, to look upon the word 'pure' when applied to ordinary air, as a merely relative term, because we know that the air is never absolutely pure; that it carries fine particles of dust at all times, even though these may not be apparent to any of the senses. Thus, the germs which set up injurious fermentations in the milk, and which produce 'gas' and objectionable flavours, may be carried to the milk under conditions which would seem to be good as far as the eye can tell. It is practically impossible to find 'pure' air, using the term in a bacteriological sense.

A knowledge of these things soon began to influence opinion on the subject from a theoretical point of view. Then on the practical side, observant cheesemakers have noticed that they frequently received the best milk from patrons who never aerated nor stirred it, but who cooled it when necessary to prevent it from souring. Since the proper use of the 'starter' has become quite general, it is found that some of the best cheese is now made from Saturday evening's milk which is never aerated and which is brought to the factory immediately after milking, in the same way that the morning's milk is delivered.

In addition to these practical observations, some experiments were conducted at various United States institutions, but in no case, as far as the writer is aware, were there recorded any positive results in favour of aeration of milk for cheesemaking. Professor Dean, of the Ontario Agricultural College, carried out some experiments about 1900 and in his conclusions, he practically condemned aeration, but as his work was done with the college herd, many cheesemakers felt at the time that the results might not be applicable to ordinary farm conditions. In the face of all this evidence, both circumstantial and direct, students of cheesemaking were bound to alter their views in relation to this question, and during recent years many cheesemakers, instructors and others have been discouraging the aeration of milk. It was felt, however, that there was a lack of authoritative data on the subject and it was with the hope of supplying that lack that the writer secured the authority of the Minister of Agriculture to institute a series of experiments bearing on the question. The duty of carrying out this work was assigned to Mr. Geo. H. Barr, chief officer of the Dairy Division, who was assisted at different times by Mr. J. G. Bouchard and Mr. I. Trudel, also of the dairy staff. The results of the experiments are presented in Mr. Barr's own words.

EXPERIMENTS RELATING TO THE AERATION OF MILK FOR CHEESEMAKING.

Mr. J. A. RUDDICK,
Dairy and Cold Storage Commissioner,
Ottawa.

SIR,—I hereby submit a report of the experimental work on the care of milk for cheesemaking, carried on at Smith's Falls, Ont., under your direction during the summer of 1908.

ARRANGEMENTS FOR CARRYING ON THE WORK.

A very satisfactory arrangement was made with Mr. John McEwen, proprietor of the Rideau Queen cheese factory, Smith's Falls, whereby we were given the use of the creamery room adjoining the cheese factory.

A number of patrons of this factory were also willing to allow us the privilege of going to their farms to take care of the milk.

At first we thought of taking the milk from six or eight farms, but found it would not be possible to get all the details in connection with the handling of the

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milk from so many places, so we finally decided to use the milk from the farms of Mr. Walter Hyslop and Mr. D. Condie.

Two small vats were installed at the factory with all the other utensils necessary for manufacturing cheese. Steam was supplied from the boiler in the cheese factory.

THE OBJECT OF THE WORK.

No attempt was made to secure information from a bacteriological standpoint but rather to discover what effect different methods of handling the milk at the farms would have on the quality of the curd and cheese.

The principal points kept in view were to ascertain the advantages or disadvantages of aerating, cooling and aerating, and cooling the milk without aeration, all under ordinary farm conditions, and if possible, discover a simple, convenient, inexpensive and effective method of treating the milk, so that it might be delivered at the cheese factories in such a condition that the cheesemakers would not have to contend with gassy and other undesirable fermentations during the process of manufacture, or suffer losses from unclean flavours in the cheese.

PLAN OF WORK.

The general routine of the work was as follows:—In the evening the writer and his assistant went to the farms in time to take care of the milk as it was drawn from the cows. The milk was divided equally into two milk cans marked A and B, and the treatment given the milk in each can varied from time to time as shown in tables 1 and 2.

We treated the milk at both farms exactly alike each evening. We did not do anything with the morning's milk at the farms. It was not cooled or aerated.

The milk was delivered at the factory by the owners, where it was weighed, and samples taken from each can for the Babcock test, Acidimeter and fermentation curd tests.

The A and B cans of the evening's milk were put into A and B vats respectively and the morning's milk when delivered separately was divided equally between the two vats.

The cheese were made according to the best methods practiced in our cheese factories. Thirty-four experiments were made, as shown in the different tables following.

CURING AND TESTING THE CHEESE.

The cheese were kept in the factory curing room for twelve or fifteen days, then shipped to the Ottawa Cold Stores. The curing room was of very ordinary construction, the temperature going as high as 84 degrees in July. The average temperatures were for June 71, July 72, and August 68 degrees.

The cheese were tested for flavour and texture just before shipping from the factory, and again on September 21st in the Ottawa Cold Stores.

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FORMS USED IN RECORDING EACH DAY'S WORK.

Experiment No. _____

FORM No. 1.

Date _____

| _____ | Can A. | Can B. | Morning's Milk. | Total Milk. | Treatment of Milk at Farm. |
|---|--------|--------|--------------------|----------------|-------------------------------|
| Wm. Hyslop. Lbs. evening milk..... Temp. at Farm..... " Factory..... % Acid at "..... % Butter Fat..... Lbs. Cheese per lb. { G. Fat C. | | | | | Can A. |
| Flavour A | | B. | | | Can B. |
| Curd Test A. | | B. | | | |
| D. Condie. Lbs. evening milk..... Temp. at Farm..... " Factory..... % Acid at "..... % Butter Fat..... Lbs. Cheese per lb. { G. Fat C. | | | | | Can A. |
| Flavour A. | | B | | | Can B. |
| Curd Test A. | | B. | | | |

Weather conditions.

Experiment No. _____

Date _____

| | Vat A. | Vat B. |
|--|--------|--------|
| Lbs. milk..... | | |
| Acidity when received | | |
| " at setting..... | | |
| Per cent starter..... | | |
| Time set | | |
| " cut | | |
| Number times cut..... | | |
| Acidity at cutting..... | | |
| Time dipped..... | | |
| Acidity—dipping | | |
| Condition of curd at dipping. | | |
| Time milled | | |
| Per cent acid—milling..... | | |
| Condition curd when milled... .. | | |
| Time salted. | | |
| Condition of curd at salting | | |
| Rate of salt..... | | |
| Per cent butter fat in milk..... | | |
| " whey | | |
| Weight green cheese | | |
| Lbs. of milk per lb. of green cheese | | |
| Weight cured cheese... .. | | |
| Lbs. of milk per lb. of cured cheese... .. | | |

EQUIPMENT AT THE FARMS.

The equipment used at each farm consisted of two aerators, a receiver for dividing the milk equally into the cans, a shotgun can for ice and water, a dipper, a thermometer, and two half barrels for setting the milk cans in cold water.

Each cow's milk was divided by pouring it into the square tin receiver with an outlet at each end placed on top of the aerators or cans, thus dividing all the milk equally into two cans marked A and B. The morning's milk when mixed with the evening's at the farm was divided in the same manner.

LOCATION OF THE FARMS FROM WHICH MILK WAS RECEIVED.

Mr. Condie's farm lies on the west and Mr. Hyslop's on the south side of the town of Smith's Falls. A portion of Mr. Condie's farm consists of drowned land adjoining the Rideau canal, and the cows pastured a good part of the summer on the flats around this swampy section. Mr. Hyslop's farm had some low land as well as high and stony soil. One could scarcely call either farm ideal pasture land for the most delicate flavoured milk, but we were very glad to have these conditions, thus giving an opportunity to see results from what may be considered about average farm lands.

THE HERDS.

Mr. Condie's herd of seventeen cows consisted of eight grade Ayrshires, four grade Holsteins, and five grade Shorthorns. Several of these cows had aborted during the winter, but were milking fairly well all season. One cow had been milking over a year.

Mr. Hyslop's herd of eighteen cows consisted of one pure bred Holstein, two grade Holsteins, and fifteen grade Ayrshires. A number of his cows had also aborted during the winter. These cows were fed silage for several weeks in July, which kept up the flow of milk well, with no detrimental effect on the milk for chesemaking.



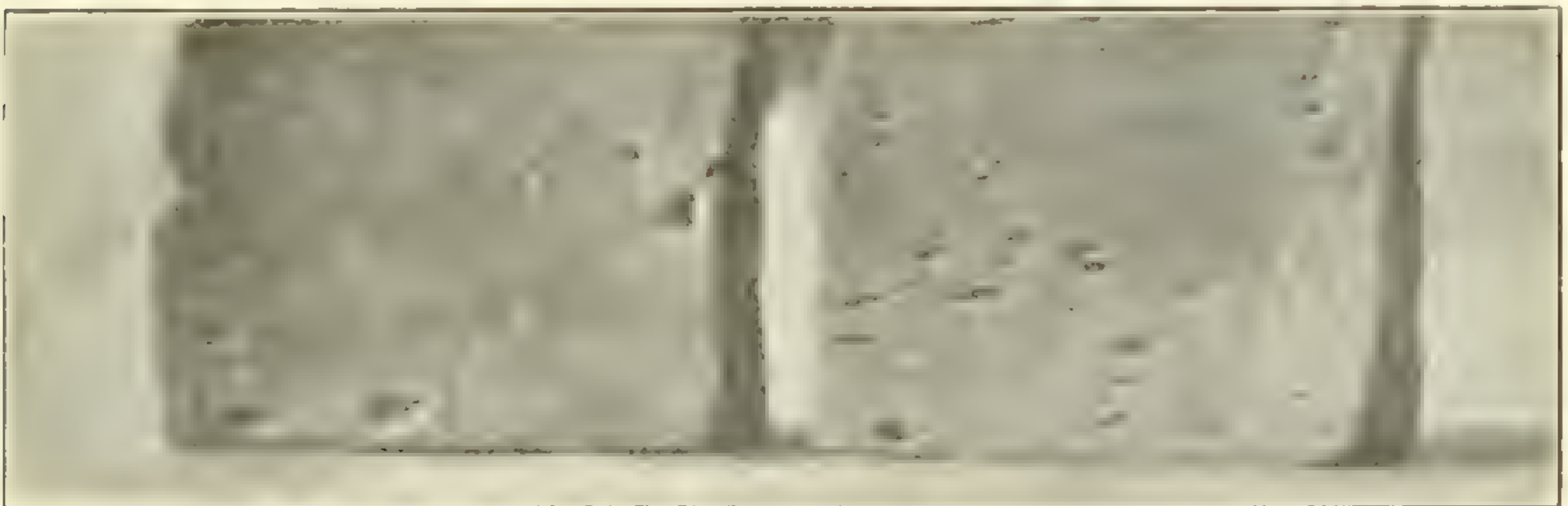
FIG. 1.—Milk stand and house at the Hyman farm. 48 p.c. of the curd tests from milk cooled by running over an aerator on this stand were gassy and not clean in flavour, and only 6.6 p.c. of the curd tests from milk cooled without aeration in the tub of water were slightly gassy and not quite clean in flavour.



FIG. 2.—Milk stand at Condie farm. 61 p.c. of the curd tests from milk dipped or run over an aerator on this stand were gassy and not clean in flavour.



FIG. 1.—Platform and watering trough in the barnyard at the Condie farm. 71 p.c. of the curd tests from milk aerated on this stand were gassy and not clean in flavour, some of them floaters. Only 6.6 p.c. of the curd tests from the milk cooled in this tub without aeration were slightly gassy and not quite clean in flavour.



A

B

FIG. 2.—Showing the condition of the curds just before milling on July 24.

'A' curd was free from gas and was clean in flavour. The milk was cooled by setting the milk cans in cold water and was not aerated.

'B' curd was very gassy in texture and was not clean in flavour. The milk was put into the milk cans and was aerated by dipping for about 20 minutes.

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THE STABLES.

The cows were always milked in the stable at both places. Mr. Hyslop's stable was frame and Mr. Condie's a stone basement under the barn. Both had wooden floors, which could not be considered by any means as sanitary as cement. The walls, ceilings and floors were dusty.

MILKING OF THE COWS.

The milking was done at Mr. Hyslop's by his four sons. The milk was poured into a strainer pail in the stable and carried to the stand and strained into the cans. Mr. Condie and his two hired men did the milking at his place. As the cows were milked, the milk was strained into shotgun cans standing behind the cows and then carried to the milk stand.

At both places, bright tin milk pails were used. No special regulations were asked for in regard to milking, or feeding the cows, our object being to take the milk as they gave it to us, and see what result different treatment at the farm would have on it when manufacturing it into cheese.

LOCATION OF THE MILK STANDS WHERE THE MILK WAS TREATED.

Fig. 1, plate 1, shows Mr. Hyslop's milk stand. This stand is close to the ice house and is 60 feet from the cow stable door. This space is in grass and fairly free from manure or dust. On the other side of the stand is the orchard and backyard of the house. It is probably a little too close to the stable, and the buildings and orchard prevent getting the full benefit of the wind from all directions, yet it is better situated than hundreds of milk stands throughout the country. Everything around it was kept clean and tidy. Notwithstanding the comparatively favourable location of this stand, 38 per cent of the curd tests from milk dipped or run over an aerator here, were gassy and not clean in flavour. The experiments in cooling the milk without aeration at his farm were made on this stand, or on the wagon standing beside it, and only 6.6 per cent of the curd tests from the cooled milk were gassy and not quite clean in flavour.

Fig. 2, plate 1, shows the milk stand at Mr. Condie's. It is at the end of the woodshed, in the corner of which is stored the ice. A roadway runs between it and the house. The horse stable is about 40 feet distant, directly in front of the stand, and the barnyard and cow stable on the other side of this about 136 feet from the stand. A hog pen is situated 88 feet from the stand, a short distance from the other end of the woodshed. This stand may be considered in a good location, as there is good circulation of air. There is, however, a little more dust around it than at the Hyslop stand. Sixty-one per cent of the curd tests from milk aerated on this stand were gassy and not clean in flavour.

Fig. 1, plate 11, shows where the milk was cooled by setting the milk can in a tub of water at Mr. Condie's. This platform is in the corner of the barnyard. A corner of the horse stable is seen to the right. The cow stable is directly in front of this trough, about 96 feet distant. All around this trough is bare ground, where the cows often stood both before and after milking, and in dry weather it was very dusty. The manure pile from the horse stable is about 52 feet from this platform.

The pump is situated behind the horse stable, 93 feet from the trough, and the water piped under ground to the trough. A gas pipe was put into the upright pump log to carry the water to the tub at the end of the trough, and a spout fixed from the tub into the trough. All the water pumped for the stock had to pass through this tub, flowing out at the top into the trough. By this arrangement, not five minutes' time was required to take care of the milk cooled in this manner, for when enough water was pumped to water the cows, the milk was cool enough to leave for the night. Only 6.6 per cent of the curd tests from milk cooled without aeration on this platform

were gassy and tainted, while 71 per cent of the curd tests from milk aerated in the same place were gassy and tainted and some of them were 'floaters.'

THE AERATION OF THE MILK.

The word 'aeration' used in this connection means the exposure of the milk to the air, either with a dipper or by running it over an aerator.

The following tables show the date, number of experiment, the treatment each lot of milk received at the farm, temperature and acidity of the milk at the factory, per cent of butter fat in the milk, and the pounds of milk used in each experiment, also the condition of the curd tests, curds in the vats, and the flavour of the cheese.

TABLE I—RECORD OF THE EXPERIMENTS

| Date. | Exp. No. | Treatment the milk received at the farms. | Temp. of the air while aerating. | Temp. of the milk when left at night. | Temp. of the water when left at night. | Lowest temp. of the air during night. | Temp. of the milk at the factory. | Acidity of the milk at the factory. | Butter-fat in the milk. | Lbs. of milk. |
|---------|----------|--|----------------------------------|---------------------------------------|--|---------------------------------------|-----------------------------------|-------------------------------------|-------------------------|---------------|
| | | | deg. | deg. | deg. | deg. | deg. | p. c. | p. c. | |
| June 17 | 1-A | Milk run over an aerator filled with water and ice | 54 | 60 | .... | .... | 55 | 17 | .... | 474 |
| | 1-B | " " without water or ice | 54 | 83 | .... | .... | 62 | 17 | .... | 474 |
| " 25 | 3-A | " " filled with cold water | 64 | 68.5 | .... | 60 | 63 | 165 | 3.4 | 432 |
| | 3-B | " " without cold water | 64 | 79.5 | .... | 60 | 64 | 167 | 3.4 | 402 |
| " 26 | 4-A | Milk in milk cans, no aeration or cooling | .... | 91 | .... | 54 | 70 | 18 | 3.5 | 463 |
| | 4-B | " " aerated by dipping | 69 | 91 | .... | 54 | 69 | 18 | 3.5 | 463 |
| " 30 | 5-A | Milk cooled by placing a shotgun can of water in it, no aeration | .... | 75.5 | .... | 63 | 75 * | 17 | 3.4 | 374 |
| | 5-B | Milk aerated by dipping | 74 | 90 | .... | 63 | 77.5* | 177 | 3.4 | 417 |
| July 1 | 6-A | Milk cooled by placing a shotgun can of water in it, no aeration | .... | 82 | .... | 58 | 76.5* | 175 | .... | 407 |
| | 6-B | Milk aerated by dipping | 70 | 91 | .... | 58 | 76.5* | 172 | .... | 402 |
| " 2 | 7-A | Milk run over an aerator on milk stand | 72.5 | 85.5 | .... | 62 | 73.5 | 17 | 3.4 | 412 |
| | 7-B | " " in barnyard | 72.5 | 84 | .... | 62 | 72 | 167 | 3.4 | 406 |
| " 3 | 8-A | " " on milk stand | 72 | 87 | .... | 63 | 78 | 17 | 3.4 | 384 |
| | 8-B | " " in barnyard | 72 | 87.5 | .... | 63 | 77 | 17 | 3.4 | 408½ |
| " 9 | 10-A | " " on milk stand | 65 | 87 | .... | 58 | 68 | 175 | 3.6 | 383 |
| | 10-B | " " in barnyard | 65 | 85.5 | .... | 58 | 64.5 | 172 | 3.6 | 396 |
| " 10 | 11-A | " " filled with water and covered | 68 | 69 | .... | 61 | 63 | 17 | .... | 381 |
| | 11-B | " " no water used | 68 | 77.5 | .... | 61 | 66 | 17 | .... | 381 |
| " 14 | 12-A | " " filled with water and covered | 68.5 | 68 | .... | 62 | 63.5 | 172 | 3.6 | 377 |
| | 12-B | " " filled with water not covered | 68.5 | 65.5 | .... | 62 | 63.5 | 17 | 3.6 | 377 |
| " 15 | 13-A | " " filled with water and covered | 66 | 69 | .... | 61 | 63 | 16 | 3.6 | 356 |
| | 13-B | " " no water used | 66 | 81 | .... | 61 | 66 | 162 | 3.6 | 356 |
| " 16 | 14-A | Milk cooled by placing a shotgun can of water in it, no aeration | .... | 77 | .... | 54 | 57 | 157 | 3.4 | 375 |
| | 14-B | Milk aerated by dipping | 64 | 85 | .... | 54 | 62 | 16 | 3.4 | 375 |
| " 21 | 15-A | Milk cans placed in a tub of water, no aeration | .... | 75.5 | 52 | 66 | 62 | 16 | 3.6 | 342 |
| | 15-B | Milk aerated by dipping | 61 | 92 | .... | 66 | 71 | .... | 3.6 | 342 |
| " 22 | 16-A | Milk cans placed in a tub of water, no aeration | .... | 77 | 55 | 66 | 63 | 16 | 3.6 | 341 |
| | 16-B | Milk aerated by dipping | 66.5 | 90 | .... | 66 | 69 | 167 | 3.6 | 341 |
| " 23 | 17-A | Milk cans placed in a tub of water, no aeration | .... | 78 | 57 | 66 | 64 | 167 | 3.6 | 337 |
| | 17-B | Milk aerated by dipping | 70.5 | 91 | .... | 66 | 71 | 177 | 3.6 | 337 |
| " 24 | 18-A | Milk cans placed in a tub of water, no aeration | .... | 78 | 54 | 65 | 64 | 165 | 3.5 | 327½ |
| | 18-B | Milk aerated by dipping | 67 | 92 | .... | 65 | 74 | 18 | 3.5 | 327½ |
| " 28 | 19-A | Milk cans placed in a tub of water, no aeration | .... | 73.5 | 54.5 | 72 | 66 | 165 | 3.5 | 334 |
| | 19-B | " " " milk dipped | 77.5 | 70.5 | 55 | 72 | 67.5 | 165 | 3.5 | 334 |
| " 29 | 20-A | " " " no aeration | .... | 77 | 56 | 71 | 68.5 | 162 | 3.5 | 327 |
| | 20-B | " " " milk dipped | 81.5 | 77 | 56 | 71 | 69.5 | 157 | 3.5 | 327 |
| " 30 | 21-A | " " " no aeration | .... | 77.5 | 59 | 74 | 70 | 17 | 3.6 | 335½ |
| | 21-B | Milk run over an aerator filled with cold water | 73.5 | 70.5 | .... | 74 | 73 | 162 | 3.6 | 335½ |
| " 31 | 22-A | Milk cans placed in a tub of water, no aeration | .... | 79.5 | 60 | 73 | 71 | 157 | 3.5 | 325 |
| | 22-B | Milk run over an aerator filled with cold water | 78 | 71 | | 73 | 72.5 | 162 | 3.5 | 335 |

* Morning's milk mixed with evening's.

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TABLE I—RECORD OF THE EXPERIMENTS—*Continued.*

| Date. | Exp. No. | Treatment the milk received at the farms. | Temp. of the air while aerating. | Temp. of the milk when left at night. | Temp. of the water when left at night. | Lowest temp. of the air during night. | Temp. of the milk at the factory. | Acidity of the milk at the factory. | Butter-fat in the milk. | Lbs. of milk. |
|--------|----------|--|-------------------------------------|--|---|--|--------------------------------------|--|----------------------------|---------------|
| | | | deg. | deg. | deg. | deg. | deg. | p. c. | p. c. | |
| Aug. 4 | 23-A | Milk cans placed in a tub of water, no aeration. | 76 | 61 | 66 | 64 | 165 | 3.5 | 328 | |
| | 23-B | Milk in milk cans, no aeration or cooling . . . | 93 | | 66 | 67 | 17 | 3.5 | 328 | |
| " 5 | 24-A | Milk cans placed in a tub of water, no aeration. | 78 | 52 | 70 | 68.5 | 165 | 3.5 | 310½ | |
| | 24-B | Milk in milk cans, no aeration or cooling | 96 | | 70 | 72 | 195 | 3.5 | 310½ | |
| " 6 | 25-A | Milk cans placed in a tub of water, no aeration. | 77.5 | 58 | 62 | 66.5 | 165 | 3.5 | 654 | |
| | 25-B | Milk from the cheese factory vat . . . | | | 62 | | 18 | 3.6 | 654 | |
| " 7 | 26-A | Milk cans placed in a tub of water, no aeration. | 71 | 64.5 | 62 | 65 | 167 | 3.5 | 312 | |
| | 26-B | Milk put into rusty cans, no aeration or cooling | 8 | | 62 | 70 | 177 | 3.5 | 312 | |
| " 11 | 27-A | Milk cooled by placing shotgun cans of water in it, no aeration . . . | 86.5 | | 62 | 69 | 165 | 3.6 | 304 | |
| | 27-B | Milk run over an aerator. | 68 | 66.5 | 62 | 68.5 | 165 | 3.6 | 304 | |
| " 12 | 28-A | Milk cooled by placing shotgun cans of water in it, no aeration . . . | | 67 | | 63 | 70 | 165 | 3.6 | 301½ |
| | 28-B | Milk run over an aerator. | 79 | 67 | | 63 | 69.5 | 165 | 3.6 | 301½ |
| " 13 | 29-A | Milk cans placed in a tub of water, no aeration. | 80 | | 70 | 71 | 165 | 3.7 | 310½ | |
| | 29-B | Milk put in rusty cans in a tub of water, no aeration . . . | | 64 | | 70 | 71 | 165 | 3.7 | 310½ |
| " 14 | 30-A | Milk cans placed in a tub of water, no aeration. | 84 | | 65 | 69.5 | 165 | 3.7 | 615 | |
| | 30-B | Milk taken from the factory vat . . . | | | 65 | | 18 | 3.6 | 615 | |
| " 18 | 31-A | Milk cans placed in a tub of water, no aeration. | 83.5 | 66.5 | 61 | 65 | 165 | 3.6 | 300 | |
| | 31-B | Milk in milk cans, no aeration or cooling | 94 | | 61 | 66 | 167 | 3.6 | 300 | |
| " 19 | 32-A | Milk in good milk cans, no aeration or cooling | | | 59 | 64.5 | 16 | 3.6 | 289½ | |
| | 32-B | Milk in rusty . . . | | | 59 | 64 | 167 | 3.7 | 289½ | |
| " 20 | 33-A | Milk in good . . . | | | 48 | 68 | 157 | 3.8 | 302 | |
| | 33-B | Milk in rusty . . . | | | 48 | 68 | 165 | 3.7 | 302 | |
| " 25 | 34-A | Milk in milk cans, no aeration or cooling | 89 | | | 70 | 167 | 3.9 | 311½ | |
| | 34-B | Milk aerated by dipping. | 85 | | | 70 | 165 | 3.9 | 333½ | |

* Morning's milk mixed with evening's.

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TABLE 2.—SHOWING CONDITION OF CURD AND CHEESE.

| Date. | Exp. No. | Treatment the milk received at the farms. | CURD TEST. | | CURDS IN THE VATS. | | Flavour of the Cheese. |
|----------|----------|--|------------|----------|--------------------|--------------|------------------------|
| | | | Flavour. | Texture. | Flavour. | Texture. | |
| June 17. | 1-A | Milk run over an aerator filled with water and ice. | ..... | ..... | Clean..... | Solid..... | Clean. |
| " | 1-B | " " without water or ice. | ..... | ..... | Clean..... | Solid..... | Not clean. |
| 25. | 3-A | " " filled with cold water. | 1 clean. | 1 solid. | Not clean.. | Gassy..... | Not clean. |
| " | 3-B | " " without cold water. | ..... | ..... | Gassy..... | Gassy..... | Not clean. |
| 26. | 4-A | Milk in milk cans, no aeration or cooling. | ..... | ..... | Not clean.. | Solid..... | Rancid. |
| " | 4-B | " " aerated by dipping. | ..... | ..... | Not clean.. | Gassy..... | Not clean. |
| 30. | 5-A | Milk cooled by placing shotgun cans of water in it, no aeration. | 2 clean. | 2 solid. | Clean..... | Solid..... | Clean. |
| " | 5-B | Milk aerated by dipping. | ..... | ..... | Gassy..... | Gassy..... | Not clean. |
| July 1. | 6-A | Milk cooled by placing shotgun cans of water in it, no aeration. | 2 clean. | 2 solid. | Clean..... | Solid..... | Not clean. |
| " | 6-B | Milk aerated by dipping. | ..... | ..... | Not clean.. | Gassy..... | Not clean. |
| 2. | 7-A | Milk run over an aerator on milk stand. | 2 clean. | 2 solid. | Clean..... | Gassy..... | Clean. |
| " | 7-B | " " in barnyard. | ..... | ..... | ..... | ..... | ..... |
| 3. | 8-A | " " on milk stand. | 1 clean. | 1 solid. | Not clean.. | Gassy..... | Not clean. |
| " | 8-B | " " in barnyard. | ..... | ..... | Good..... | Solid..... | Not clean. |
| 9. | 10-A | " " on milk stand. | 1 clean. | 1 solid. | Gassy..... | Very gassy.. | Not clean. |
| " | 10-B | " " in barnyard. | 1 clean. | 1 solid. | Clean..... | Solid..... | Clean. |
| 10. | 11-A | " " filled with water and covered. | 2 clean. | 2 solid. | Clean..... | Solid..... | Not clean. |
| " | 11-B | " " no water used. | 1 clean. | 1 solid. | Not clean.. | Solid..... | Not clean. |
| 14. | 12-A | " " filled with water and covered. | 1 clean. | 1 solid. | Clean..... | Solid..... | Not clean. |
| " | 12-B | " " filled with water not covered. | 2 clean. | 2 solid. | Not clean.. | Gassy..... | Rancid. |
| 15. | 13-A | " " filled with water and covered. | ..... | ..... | Not clean.. | Solid..... | Fruity. |
| " | 13-B | " " no water used. | ..... | ..... | Clean..... | Solid..... | Clean. |
| 16. | 14-A | Milk cooled by placing shotgun cans of water in it, no aeration. | 2 clean. | 2 solid. | Not clean.. | Gassy..... | Not clean. |
| " | 14-B | Milk aerated by dipping. | ..... | ..... | Clean..... | Solid..... | Clean. |
| 21. | 15-A | Milk cans placed in a tub of water, no aeration. | 2 clean. | 2 solid. | Not clean.. | Solid..... | Clean. |
| " | 15-B | Milk aerated by dipping. | ..... | ..... | Clean..... | Solid..... | Not clean. |
| 22. | 16-A | Milk cans placed in a tub of water, no aeration. | 2 clean. | 2 solid. | Not clean.. | Gassy..... | Fruity. |
| " | 16-B | Milk aerated by dipping. | ..... | ..... | Clean..... | Solid..... | Clean. |
| 23. | 17-A | Milk cans placed in a tub of water, no aeration. | 2 clean. | 2 solid. | Gassy..... | Gassy..... | Fruity. |
| " | 17-B | Milk aerated by dipping. | 1 clean. | 1 solid. | Clean..... | Solid..... | Clean. |
| 24. | 18-A | Milk cans placed in a tub of water, no aeration. | 2 clean. | 2 solid. | Gassy..... | Gassy..... | Fruity. |
| " | 18-B | Milk aerated by dipping. | | | Clean..... | Solid..... | Clean. |
| | | | 2 clean. | 2 solid. | Gassy..... | Gassy..... | Fruity. |

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| | | | | | | | | | | |
|------|------|------|---|----------|--------------|----------|----------|------------|--------|------------|
| " | 28.. | 19-A | Milk cans placed in a tub of water, no aeration | 2 clean. | 1 not clean. | 2 solid. | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 19 B | " " milk dipped | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Not clean. | Solid | Clean. |
| " | 29.. | 20-A | " " no aeration | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 20 B | " " milk dipped | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Not clean. | Solid | Clean. |
| " | 30.. | 21 A | " " no aeration | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 21 B | Milk run over an aerator filled with cold water | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Not clean. |
| " | 31.. | 22 A | Milk cans placed in a tub of water, no aeration | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 22 B | Milk run over an aerator filled with cold water | 2 clean. | 2 not clean. | 2 solid | 2 gassy. | Clean. | Solid | Clean. |
| Aug. | 4.. | 23 A | Milk cans placed in a tub of water, no aeration | 2 clean. | 2 not clean. | 2 solid | 2 gassy. | Clean. | Solid | Rancid. |
| " | " | 23 B | Milk in milk cans, no aeration or cooling | 2 clean. | 2 not clean. | 2 solid | 2 gassy. | Not clean. | Solid | Rancid. |
| " | 5.. | 24 A | Milk cans placed in a tub of water, no aeration | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 24 B | Milk in milk cans, no aeration or cooling | 1 clean. | 2 not clean. | 2 solid | 1 gassy. | Not clean. | Solid | Not clean. |
| " | 6.. | 25 A | Milk cans placed in a tub of water, no aeration | 1 clean. | 1 weedy | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 25 B | Milk from the cheese factory vat | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Gassy. | Gassy | Gassy. |
| " | 7.. | 26 A | Milk cans placed in a tub of water, no aeration | 1 clean. | 2 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 26 B | Milk put into rusty cans, no aeration or cooling | 1 clean. | 2 not clean. | 1 solid | 1 gassy. | Clean. | Gassy | Dirty. |
| " | 11. | 27 A | Milk cooled by placing shotgun cans of water in it, no aeration | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 27 B | Milk run over an aerator | 1 clean. | 2 gassy. | 1 solid | 2 gassy. | Gassy. | Gassy. | Not clean. |
| " | 12.. | 28 A | Milk cooled by placing shotgun cans of water in it, no aeration | 2 clean. | 1 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 28 B | Milk run over an aerator | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | 13.. | 29 A | Milk cans placed in a tub of water, no aeration | 2 clean. | 1 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 29 B | Milk put in rusty cans in tub of water, no aeration | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | 14.. | 30 A | Milk cans placed in a tub of water, no aeration | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Not clean. |
| " | " | 30 B | Milk taken from the factory vat | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Not clean. |
| " | 18.. | 31 A | Milk cans placed in a tub of water, no aeration | 2 clean. | 2 not clean. | 2 solid | 2 gassy. | Clean. | Solid | Clean. |
| " | " | 31 B | Milk in milk cans, no aeration or cooling | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | 19.. | 32 A | Milk in good milk cans, no aeration or cooling | 1 clean. | 1 not clean. | 1 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 32 B | Milk in rusty milk cans, no aeration or cooling | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | 20.. | 33 A | Milk in good milk cans, no aeration or cooling | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 33 B | Milk in rusty milk cans, no aeration or cooling | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | 25.. | 34 A | Milk in milk cans, no aeration or cooling | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |
| " | " | 34 B | Milk aerated by dipping | 2 clean. | 1 not clean. | 2 solid | 1 gassy. | Clean. | Solid | Clean. |

NOTE.—In making the curl tests a sample was taken from cans A and B from each farm, thus making 2 curl tests in each A and B lot. For example, in experiment number 29, Aug. 13th B can from the Hyslop farm was clean while B can from the Condit farm was not clean and gassy.

RESULTS OF AERATING THE MILK WITH A DIPPER.

When we used the dipper, the milk was put directly into the milk cans as it was milked, and dipped occasionally during milking time. After the milking was finished, dipping was continued for ten or fifteen minutes. In most cases, the covers were left off the cans over night when the milk was dipped, as this is the usual practice at the farms. Dipping the milk lowered the temperature on an average about 6.5 degrees, the average temperature when left about fifteen minutes after milking was finished being 89.6 degrees.

AERATING THE MILK BY RUNNING IT OVER A CHAMPION AERATOR.

The aerator used was well made of good tin, of such a shape that it was easily cleaned, and it could be used as a combined aerator and cooler by filling it with cold water or water and ice.

The time required to prepare one of these aerators for use and again wash it after using, is close upon twenty minutes, and like all other utensils used in connection with milk, if it is not properly washed and scalded it soon becomes a source of contamination instead of a benefit to the milk. In our experiments it usually took about an hour to pass the milk over this aerator, as that was about the time it took to do the milking.

The temperature of the milk was lowered from 8.5 to 18.5 degrees while running over the aerator, according to the temperature of the air, the average reduction of temperature being 12 degrees, leaving the milk in the cans at an average of 84 degrees about ten minutes after milking was finished.

| Date. | Exp. No. | CURD TESTS. | | | | CURDS IN THE VATS. | | Flavour of the cheese. |
|---------|----------|-------------|-------------|----------|------------|--------------------|------------|------------------------|
| | | Flavour. | | Texture. | | Flavour. | Texture. | |
| June 17 | 1-B | | | | | Clean | Solid | Not clean. |
| " 25 | 3-B | | 2 not clean | | 2 gassy | Gassy | Gassy | Not clean. |
| July 2 | 7-A | 2 clean | | 2 solid | | Clean | Gassy | Clean |
| " 2 | 7-B | | 2 gassy | | 2 gassy | Gassy | Gassy | Not clean. |
| " 3 | 8-A | 1 clean | 1 gassy | 1 solid | 1 floater | Clean | Solid | Not clean. |
| " 3 | 8-B | | 2 gassy | | 2 floaters | Gassy | Very gassy | Not clean. |
| " 9 | 10-A | 1 clean | 1 not clean | 1 solid | 1 gassy | Clean | Solid | Clean |
| " 9 | 10-B | 1 clean | 1 not clean | 1 solid | 1 gassy | Clean | Solid | Not clean. |
| " 10 | 11-B | 1 clean | 1 not clean | 1 solid | 1 gassy | Not clean | Solid | Not clean. |
| " 15 | 13-B | | 2 gassy | | 2 gassy | Not clean | Gassy | Not clean. |
| Aug. 11 | 27-B | | 2 gassy | | 2 gassy | Gassy | Gassy | Not clean. |
| " 12 | 28-B | 1 clean | 1 not clean | 1 solid | 1 gassy | Clean | Solid | Clean |

MILK AERATED AND COOLED BY USING THE CHAMPION AERATOR FILLED WITH WATER AND WATER AND ICE.

We only used ice in the water twice, as we found if the coolers were filled with well water at 46 degrees we could cool the quantity of milk we were using (80 to 100 pounds) quite low enough. Each cooler held about 120 pounds of water. When ice was used, a much lower temperature could be secured.

The average temperature of the milk about fifteen minutes after milking was finished was 67.7 degrees, thus lowering the temperature 28.3 degrees while passing over the cooler.

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| Date. | Exp. No. | CURD TESTS. | | | | CURDS IN THE VATS. | | Flavour of the Cheese. |
|-------------------|----------|-------------|---------------|-------------|--------------|--------------------|----------|------------------------|
| | | Flavour. | | Texture. | | Flavour. | Texture. | |
| June 17 | 1-A | | | | | Clean | Solid | Clean. |
| " 25 | 3-A | 1 clean... | 1 not clean.. | 1 solid.... | 1 gassy..... | Not clean. | Gassy | Not clean. |
| July 14. | 12-B | 2 " ... | | 2 " ... | | | | Fruity. |
| " 30 | 21-B | 2 " ... | | 2 " ... | | Clean. | Solid. | Not clean. |
| " 31. | 22-B | | 2 not clean. | | 2 gassy..... | | " | Clean |
| " 10 | 11-A | 2 clean... | | 2 solid... | | | " | Not clean. |
| " 14 | 12-A | 1 " ... | 1 not clean.. | 1 " ... | 1 gassy.... | " | " | Rancid. |
| " 15..... | 13-A | | 2 " | | 2 " | " | " | Not clean. |

MILK COOLED IN A TUB OF WATER AND AERATED WITH A DIPPER.

Only two lots were treated in this manner. The cans were placed in the water before milking commenced and the milk poured into these cans as the cows were milked. It was dipped occasionally during milking and for ten or fifteen minutes afterwards, the average temperature then being 74 degrees. By this method the temperature was lowered 22 degrees, the quantity of water used being from 180 to 200 pounds.

| Date. | Exp. No. | CURD TESTS. | | | | CURDS IN THE VATS. | | Flavour of the Cheese. |
|------------------|----------|-------------|---------------|-------------|---------------|--------------------|----------|------------------------|
| | | Flavour. | | Texture. | | Flavour. | Texture. | |
| July 2 | 19-B | 1 clean.... | 1 not clean.. | 1 solid.... | 1 gassy. | Not clean. | Solid | Clean. |
| " 20 | 20-B | 1 " ... | 1 " ... | 1 " ... | 1 " ... | | " | " |

MILK COOLED BY PLACING A SHOTGUN CAN OF WATER OR WATER AND ICE INTO THE MILK.
NO AERATION.

In most cases, the can of water was put into the milk during milking, and re-filled with fresh water shortly after milking was finished, about 75 pounds of water being used. When ice and water were used, we did not need to change it, about 25 pounds of water and 8 or 10 pounds of ice being sufficient to cool from 80 to 100 pounds of milk. The temperature of the milk was reduced 9.5 to 20.5 degrees about ten minutes after milking was finished. The lower temperature was secured when ice was used. The can of water was left in the milk all night. The covers were always put on the milk cans about ten minutes after milking was finished. The average temperature of the milk at this time was 81.6 degrees. Great care was taken to keep the outside of the shotgun cans perfectly clean before putting them into the milk. A little dust or dirt on the outside of the cans will give very bad results.

| Date. | Exp. No. | CURD TESTS. | | | | CURDS IN THE VATS. | | Flavour of the Cheese. |
|-------------------|----------|-------------|--------------|------------|------------|--------------------|----------|------------------------|
| | | Flavour. | | Texture. | | Flavour. | Texture. | |
| June 30 | 5-A | 2 clean... | | 2 solid... | | Clean | Solid | Clean. |
| July 1.... | 6-A | 2 " ... | | 2 " ... | | | " | Not clean |
| " 16 | 14-A | 2 " ... | | 2 " ... | | | " | Clean. |
| Aug. 11..... | 27-A | 1 " ... | 1 not clean. | 1 " ... | 1 gassy... | " | " | |
| " 12..... | 28-A | 2 " ... | | 1 " ... | 1 " | " | " | " |

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MILK COOLED BY PLACING THE MILK CANS IN A TUB OF COLD WATER. NO AERATION.

One half of a gasoline barrel was used for a tub. At Mr. Hyslop's the milk was cooled either on the milk stand or on the milk wagon standing beside the stand. (Fig. 1, plate 1). Our custom was to fill the tub with water from the well before milking commenced, and set the milk can in it, and as the cows were milked, the milk was strained into the can. We found that 180 to 200 pounds of water would cool one half of the milk from eighteen cows. This milk was seldom stirred and never dipped. About the only agitation it received was to stir it with the thermometer to get the temperature, and as soon as milking was finished the cover was put on and the can left sitting in the water all night. The water used came from the well at 46 degrees temperature. The average temperature of the water in the tub when we left it (about five minutes after the milking was finished) was 59.6 degrees and the milk at the same time was 77.3 degrees. The average temperature of the evening's milk at the factory the following morning was 66.5 degrees. No time was spent on this milk after the milking was finished.

At Mr. Condie's farm the milk was cooled as shown in Plate II, Fig. 1. Usually enough water was pumped for the cows before they were put in the stable to milk, leaving the tub full of water at about 47 degrees temperature. The milk can was set in this water and as it was filled with milk, it forced a good deal of the water over into the watering trough. It was seldom necessary to pump any more water to cool half of the milk from seventeen cows.

The milk was not aerated in any way and the only stirring it received was with the thermometer when taking the temperature.

The cover was put on the can as soon as milking was finished. The temperatures of the water and the milk were practically the same as at Mr. Hyslop's.

| Date. | Exp. No. | CURD TESTS. | | | | CURDS IN THE VATS. | | Flavour of the Cheese. |
|---------------|----------|-------------|-------------|----------|---------|--------------------|----------|------------------------|
| | | Flavour. | | Texture. | | Flavour. | Texture. | |
| July 21... .. | 15-A | 2 clean | ..... | 2 solid | ..... | clean | solid | not clean |
| " 22..... | 16-A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 23..... | 17-A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 24..... | 18 A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 28..... | 19-A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 29..... | 20-A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 30..... | 21 A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 31..... | 22-A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| Aug. 4..... | 23 A | 2 clean | ..... | 2 solid | ..... | clean | solid | rancid |
| " 5..... | 24-A | 2 clean | ..... | 2 solid | ..... | clean | solid | clean |
| " 6..... | 25-A | 1 clean | 1 weedy | 2 solid | ..... | clean | solid | clean |
| " 7..... | 26 A | 1 clean | 1 not clean | 1 solid | 1 gassy | clean | solid | clean |
| " 13..... | 29 A | 2 clean | ..... | 1 solid | 1 gassy | clean | solid | clean |
| " 14..... | 30 -A | 2 clean | | 2 solid | | clean | solid | clean |
| " 18..... | 31-A | 2 clean | | 2 solid | | clean | solid | clean |

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SUMMARY OF THE DEFECTS IN THE CURDS AND CHEESE FROM MILK TREATED IN FIVE DIFFERENT WAYS.

| | Milk aerat- ed by dipping. | Milk run over an aerator. | Milk aerat- ed and cooled. | Milk cooled with water in shotgun. | Milk cooled in tub of water. |
|------------------------------|----------------------------------|---------------------------------|----------------------------------|--|------------------------------------|
| No. curd tests | 18 | 22 | 18 | 10 | 30 |
| Not clean flavour | 83.4 p. c. | 68.2 p. c. | 44 p. c. | 10 p. c. | 6.6 p. c. |
| Gassy texture | 77.8 " | 68.2 " | 44 " | 20 " | 6.6 " |
| No. of curds..... | 9 | 12 | 10 | 5 | 15 |
| Not clean flavour | 88.9 p. c. | 50.0 p. c. | 40 p. c. | 00 | 00 |
| Gassy texture | 77.8 " | 50.0 " | 20 " | 00 | 00 |
| Cheese not clean flavour.... | 77.8 p. c. | 75.0 p. c. | 60 p. c. | 20 p. c. | 13.3 p. c. |

The milk cooled as shown in the last two columns was not dipped and scarcely ever stirred except to get the temperature. The covers were put on the cans immediately after milking was finished.

STARTERS.

We found it necessary to use one half of one per cent starter in nearly all the milk, to enable us to get the curds far enough advanced to leave them and go out to the farms to look after the milk in the evenings. Had we been able to make the cheese without using any starter, I am quite convinced we would have seen a greater difference in the curds and cheese from the different methods of handling the milk.

I would prefer using less than this amount of starter to get the best results. In a few cases, one per cent was used and the results were not satisfactory, as the cheese were inclined to be short and acidy, and lacked that nutty, cheesy flavour which is so desirable.

PER CENT FAT IN THE MILK.

Babcock tests were made of the milk in each vat every day, and during the full series of experiments only twice was there any difference in the tests, showing that the treatment the milk received at the farm had little or no effect upon the per cent of butter fat.

The per cent of fat varied a good deal during the three months. On June 25th, the vats tested 3.4 per cent, June 26th, 3.5 per cent. The test remained at 3.4 from June 27th to July 3rd. July 9th, it tested 3.6 per cent, remaining at this point, with the exception of one day, until July 24th, when it dropped to 3.5 and tested 3.5 per cent with the exception of three times until August 11th, when it again tested 3.6 for two days, varying between 3.6 per cent and 3.9 per cent up to August 25th. The average test for the season was 3.54 per cent.

ACIDITY OF THE MILK.

The per cent of acid in the milk receiving exactly the same treatment at each farm, varied considerably. The milk from the Hyslop farm nearly always showed the higher acidity.

The average tests for the season were as follows:—

| | EVENING'S MILK. | | MIXED MILK. | | MORNING'S MILK. |
|-------------------|-----------------|-----|-------------|-----|-----------------|
| | A | B | A | B | — |
| Hyslop's. | 169 | 174 | 170 | 171 | 165 |
| Comlie's. | 160 | 162 | 166 | 168 | 160 |

The average temperature and acidity of the milk when delivered at the factory was:—

| | Temperature. | Acidity. |
|---|--------------|----------|
| 4 lots in rusty cans, no aeration or cooling. | 68.2* | 168 |
| 21 lots aerated without cooling | 70.9 | 169 |
| 20 lots cooled without aeration. | 67.3 | 165 |
| 10 lots aerated and cooled. | 65.3 | 165 |

Average loss of butter fat in the whey from different methods of treating the milk at the farms.

| | |
|--|------|
| Milk put in rusty cans, no aeration or cooling | 233% |
| Milk aerated without cooling. | 219% |
| Milk aerated and cooled. | 211% |
| Milk cooled without aeration. Cans covered. | 203% |

AVERAGE POUNDS OF MILK PER POUND CHEESE.

We have considerable data in connection with this phase of the subject, but we feel on account of using small quantities of milk, our figures are not as reliable as we would desire. We believe as correct results may be obtained from small quantities of milk as from large in relation to flavours in the milk, curd and cheese, but are of the opinion that to get reliable information in regard to the yield of cheese the work should be done in the ordinary factory vats.

SUMMARY.

The results of the experiments may be summarized as follows:—

1. It is very clear that the safest method of caring for milk intended for cheese-making is to cool it slightly as soon as possible after milking and then keep it covered over night. In cool weather there is sufficient reduction of temperature through the medium of the cool air, but when the air is warm, cold water or water and ice is necessary to remove the heat from the milk.
2. The aeration of milk by dipping or by running it over an aerator, will not give a uniform quality of milk. The same can be said of aeration and cooling combined. Aeration alone will not keep the milk sweet enough for cheesemaking purposes during the hot summer months.
3. It is practically impossible to determine by general observation that any place is free from the conditions which produce bad results in the aeration of milk. Milk aerated in a certain place one evening may produce a clean flavoured curd ; exactly the same treatment in the same place the next evening, or a week after, may produce quite the opposite result, although to all appearances the climatic conditions and surroundings were equally good on both occasions.
4. The milk which was cooled with as little exposure to the air as possible and covered when milking was finished, produced the best curds and cheese.

* Nights very cool.

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5. Placing the milk cans in cold water was found to be advisable for the following reasons: (a) There were no extra utensils used which required washing. (b) With the water tank arranged as recommended, no time was spent in taking care of the milk after milking was finished. (c) No water was used in excess of what was necessary for watering the stock. (d) The milk was in a uniformly good condition regardless of weather conditions.

6. The cooling was effected in some cases by placing a vessel containing cold water or ice directly in the milk, but that plan carries the objection that it is the outside surface of this vessel which comes into contact with the milk and that surface is hard to keep clean.

7. Putting the covers on the milk cans almost immediately after milking was finished, gave better results than leaving them off all night.

It is claimed that objectionable feed flavours are eliminated to some extent at least by the process of aeration. The experiments did not cover that point, but even if it is admitted that aeration does remove feed flavours, there is abundant proof that the process almost invariably affords an opportunity for the infection of the milk with germs of fermentation, which may in the end produce more objectionable results than the feed flavours which it is sought to remove.

Further work on a somewhat different plan will be necessary to determine the loss in yield of cheese when the milk is overripe and gassy.

ACKNOWLEDGMENTS.

I am very much indebted to Mr. J. G. Bouchard and Mr. I. Trudel, for their interest and valuable assistance in carrying on the work. Also to Mr. R. Perry, manager of the cheese factory, who in many ways gave us useful help during the summer.

I am also very grateful for the exceedingly kind treatment we received at the homes of Mr. Hyslop and Mr. Condie. They were at all times willing to assist us and made the work at the farms very pleasant.

GEO. H. BARR,

SOME STATISTICS OF THE DAIRY TRADE.

CHEESE IMPORTS INTO THE UNITED KINGDOM, FROM BRITISH TRADE RETURNS,
YEARS ENDED DECEMBER 31ST.

[illegible]

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BUTTER IMPORTS INTO THE UNITED KINGDOM, FROM BRITISH TRADE RETURNS, YEARS ENDED DECEMBER 31ST.

| From | 1901. | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Cwt. | Cwt. | Cwt. | Cwt. | Cwt. | Cwt. | Cwt. | Cwt. |
| Russia | 378,452 | 490,091 | 484,328 | 404,717 | 461,140 | 606,549 | 657,649 | 639,118 |
| Sweden | 180,212 | 191,591 | 212,232 | 206,791 | 188,209 | 182,803 | 226,740 | 238,929 |
| Denmark | 1,597,186 | 1,703,032 | 1,771,654 | 1,708,619 | 1,630,363 | 1,675,761 | 1,818,811 | 1,857,103 |
| Germany | 26,983 | 26,375 | 12,507 | 4,080 | 5,372 | 10,701 | 7,297 | 3,195 |
| Netherlands..... | 298,912 | 393,261 | 343,761 | 252,262 | 209,897 | 195,366 | 168,496 | 244,356 |
| France..... | 311,601 | 414,240 | 454,088 | 371,061 | 348,442 | 319,401 | 281,306 | 394,612 |
| United States... | 159,126 | 54,458 | 42,405 | 68,754 | 84,874 | 157,312 | 1,063 | 39,540 |
| Australia | 248,168 | 80,397 | 121,165 | 480,778 | 450,293 | 545,827 | 598,986 | 409,106 |
| New Zealand.... | 167,343 | 157,993 | 249,879 | 294,982 | 300,418 | 311,672 | 313,863 | 221,395 |
| Canada | 215,588 | 285,765 | 185,437 | 268,607 | 292,117 | 190,968 | 34,753 | 47,877 |
| Other countries.. | 128,319 | 177,730 | 183,238 | 180,354 | 176,741 | 140,898 | 101,192 | 115,590 |
| Total. | 3,702,890 | 3,974,933 | 4,060,694 | 4,241,005 | 4,147,866 | 4,337,258 | 4,210,156 | 4,210,821 |
| | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| Russia | 10·2 | 12·3 | 11·9 | 9·5 | 11·1 | 14·1 | 15·6 | 15·2 |
| Sweden..... | 5·1 | 4·8 | 5·2 | 4·9 | 4·5 | 4·2 | 5·4 | 5·7 |
| Denmark | 43·1 | 42·8 | 43·4 | 40·3 | 39·3 | 38·6 | 43·2 | 44·1 |
| Germany | 0·7 | 0·6 | 0·3 | 0·1 | 0·1 | 0·3 | 0·2 | 0·1 |
| Netherlands.... | 8·1 | 9·9 | 8·5 | 5·9 | 5·1 | 4·5 | 4·0 | 5·8 |
| France..... | 8·4 | 10·4 | 11·2 | 8·7 | 8·4 | 7·1 | 6·7 | 9·7 |
| United States... | 4·0 | 1·4 | 1·1 | 1·6 | 2·0 | 3·6 | ..... | 0·9 |
| Australia | 6·7 | 2·2 | 3·2 | 11·3 | 10·8 | 12·5 | 14·2 | 9·5 |
| New Zealand.... | 4·5 | 3·9 | 6·1 | 6·9 | 7·5 | 7·2 | 7·5 | 5·3 |
| Canada | 5·8 | 7·2 | 4·6 | 6·3 | 7·0 | 4·4 | 0·8 | 1·1 |
| Other countries.. | 3·4 | 4·5 | 4·5 | 4·5 | 4·2 | 3·5 | 2·4 | 2·6 |
| Total..... | 100 0 | 100 0 | 100·0 | 100·0 | 100·0 | 100·0 | 100·0 | 100 0 |

TABLE IV.—TOTAL EXPORTS OF CHEESE AND BUTTER IN FISCAL YEARS 1880 TO 1909 INCLUSIVE.

| BUTTER. | | | CHEESE. | | |
|------------------------------|------------|-----------|------------------------------|-------------|------------|
| Year. | Quantity. | Value. | Year. | Quantity. | Value. |
| <i>Years ending June 30.</i> | Lbs. | \$ | <i>Years ending June 30.</i> | Lbs. | \$ |
| 1880 | 18,535,362 | 3,058,069 | 1880..... | 40,368,678 | 3,893,366 |
| 1890 | 1,951,585 | 340,131 | 1890..... | 94,260,187 | 9,372,212 |
| 1891 | 3,768,101 | 602,175 | 1891..... | 106,202,140 | 9,508,800 |
| 1892..... | 5,736,696 | 1,056,058 | 1892.. . . . | 118,270,052 | 11,652,412 |
| 1893..... | 7,036,013 | 1,296,814 | 1893..... | 133,946,365 | 13,407,470 |
| 1894..... | 5,534,621 | 1,095,588 | 1894..... | 154,977,480 | 15,488,191 |
| 1895 | 3,650,258 | 697,476 | 1895..... | 146,004,650 | 14,253,002 |
| 1896 | 5,889,241 | 1,052,089 | 1896..... | 164,689,123 | 13,956,571 |
| 1897..... | 11,453,351 | 2,089,173 | 1897..... | 164,220,699 | 14,676,239 |
| 1898 | 11,253,787 | 2,046,686 | 1898..... | 196,703,323 | 17,572,763 |
| 1899 | 20,139,195 | 3,700,873 | 1899..... | 189,827,839 | 16,776,765 |
| 1900 | 25,259,737 | 5,122,156 | 1900..... | 185,984,430 | 19,856,324 |
| 1901 | 16,335,528 | 3,295,663 | 1901..... | 195,926,397 | 20,696,951 |
| 1902 | 27,855,978 | 5,660,541 | 1902..... | 200,946,401 | 19,686,281 |
| 1903..... | 34,128,944 | 6,954,618 | 1903.. . . . | 229,099,925 | 24,712,943 |
| 1904 | 24,568,001 | 4,724,155 | 1904..... | 233,980,716 | 24,184,566 |
| 1905 | 31,764,303 | 5,930,379 | 1905..... | 215,733,259 | 20,300,500 |
| 1906 | 34,031,525 | 7,075,539 | 1906..... | 215,834,543 | 24,433,169 |
| <i>Years ending Mar. 31.</i> | | | <i>Years ending Mar. 31.</i> | | |
| 1907 (9 months) | 18,078,508 | 4,011,609 | 1907 (9 months)..... | 178,141,567 | 22,006,584 |
| 1908 | 4,786,954 | 1,068,703 | 1908..... | 189,710,463 | 22,887,237 |
| 1909..... | 6,326,355 | 1,521,436 | 1909..... | 164,907,139 | 20,384,666 |

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TABLE V. DETAILED STATEMENT OF EXPORTS OF CHEESE IN FISCAL YEARS 1902 TO 1909 INCLUSIVE.

(Years ending June 30, 1902 to 1906, and years ending March 31, 1907 to 1909.)

| To | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1909. |
|----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Great Britain | 19,620,239 | 24,620,004 | 24,090,004 | 20,174,211 | 24,200,908 | 21,909,879 | 22,703,736 | 20,268,166 |
| Australia | 6,862 | 6,913 | 6,247 | 5,411 | 5,300 | 245 | 525 | 223 |
| British Africa | 868 | 2,514 | 7,559 | 10,612 | 16,623 | 18,261 | 16,362 | 12,466 |
| B. W. Indies. | 18,542 | 44,674 | 34,253 | 56,176 | 25,509 | 13,666 | 27,553 | 26,940 |
| B. E. Indies. | 60 | 40 | 315 | 62 | 10 | | | |
| British Guiana. | 1,833 | 2,163 | 1,193 | 2,571 | 3,800 | 3,143 | 6,228 | 4,452 |
| Other British Possessions. | 746 | 553 | 216 | | | | 9 | 1 |
| Hong Kong. | | 161 | 1,253 | 1,079 | 1,029 | | 851 | 2,452 |
| New Zealand. | 216 | 983 | 1,039 | 1,642 | 1,795 | 1,690 | 1,302 | 549 |
| Newfoundland | 20,100 | 21,334 | 21,754 | 22,171 | 30,992 | 37,748 | 37,792 | 41,163 |
| Belgium | | | 10 | 22 | 287 | | 2,080 | |
| Argentina. | | 14 | | | | | | |
| Cuba. | 320 | 331 | 211 | 102 | 811 | | 57 | |
| China | 1,409 | 1,734 | 1,899 | 2,013 | 2,195 | 2,206 | 1,572 | 568 |
| Danish West Indies | 332 | 2,037 | 1,936 | 2,046 | 2,056 | 1,568 | 1,985 | 1,937 |
| France | | | 41 | 700 | 7,203 | | 10 | 81 |
| Japan. | 821 | 1,076 | 1,609 | 759 | 775 | 1,071 | 1,444 | 2,200 |
| Philippine Islands | | 289 | 109 | | | | | |
| St. Pierre | 158 | 120 | 356 | 341 | 875 | 318 | 190 | 361 |
| United States | 12,038 | 7,779 | 5,386 | 14,182 | 16,082 | 6,900 | 17,732 | 19,428 |
| Dutch West Indies. | 538 | | | | | | | |
| Norway and Sweden | | | | | | | | |
| Germany | 1,179 | 170 | | 104 | 994 | | | |
| Bermuda | | | | 354 | | 54 | 3 | |
| Dutch Guiana | | 15 | 23 | 12,565 | 14,043 | 9,080 | 9,245 | 3,174 |
| Egypt. | | 50 | | 18 | 13 | 9 | | |
| Mexico. | | | 179 | 329 | 1,794 | 659 | 108 | 499 |
| French West Indies. | | 7 | | | | | | |
| Central America | | | | 80 | | | 347 | 3 |
| Holland. | | | | | 97 | 116 | | |
| U. S. of Columbia | | | | | 68 | | | |
| Other Countries. | | | | | | | 6 | |
| Totals. | 19,686,291 | 24,712,943 | 24,184,766 | 20,300,500 | 24,433,169 | 22,064,584 | 22,887,227 | 20,384,666 |

TABLE VI.—DETAILED STATEMENT OF EXPORTS OF BUTTER IN FISCAL YEARS 1902 TO 1909, INCLUSIVE.
(Years ending June 30, 1902 to 1906; years ending March 31, 1907 to 1909.)

| To | 1902. | 1903. | 1904. | 1905. | 1906. | 1907. | 1908. | 1906. |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ |
| Great Britain..... | 5,459,800 | 6,554,014 | 4,400,774 | 5,568,999 | 6,802,003 | 3,805,925 | 823,761 | 1,273,484 |
| British West Indies .. | 71,816 | 112,968 | 127,790 | 80,323 | 87,085 | 59,313 | 85,371 | 95,350 |
| British Guiana | 6,796 | 7,565 | 6,412 | 8,929 | 11,654 | 8,113 | 12,861 | 7,711 |
| Other British Possessions..... | 284 | 72 | | | | | 5 | |
| Hong Kong | | | | | | | | |
| Newfoundland..... | 47,066 | 69,017 | 88,422 | 82,387 | 48,283 | 56,516 | 34,931 | 54,552 |
| China..... | 78 | 141 | 1,763 | 562 | 761 | 5,041 | 1,319 | |
| Cuba..... | 243 | 202 | 796 | 658 | 285 | 1,034 | 720 | 96 |
| Danish West Indies | 1,581 | 6,077 | 5,868 | 4,473 | 4,560 | 3,664 | 4,939 | 4,418 |
| French West Indies | | 1,020 | | | | | | |
| Germany | 101 | 13 | 25,644 | | | | | |
| Hawaii..... | | 115 | | | | | | |
| Haiti..... | | 38 | | | | | | |
| Japan..... | 1,013 | 1,816 | 6,027 | 6,496 | 9,373 | 9,062 | 4,258 | 3,019 |
| St. Pierre | 27,102 | 28,655 | 26,598 | 21,827 | 17,668 | 17,615 | 18,749 | 14,740 |
| United States | 41,149 | 10,225 | 6,497 | 70,580 | 33,965 | 3,539 | 38,899 | 18,216 |
| British Africa..... | 12 | 133,958 | 16,417 | 4,914 | 2,056 | 265 | | 22,458 |
| Mexico..... | | 4,685 | | | 1,268 | 481 | 265 | 660 |
| Brazil..... | 1,608 | 9,084 | | | | | | |
| Dutch West Indies..... | 2,040 | | | | | | | |
| U. S. Colombia..... | 92 | 1,175 | 2,272 | 200 | 1,747 | 2,145 | | 1,105 |
| Australia..... | 260 | 6,187 | | | | | | |
| Bermuda..... | | | | | 47,045 | 33,900 | 33,177 | 14,273 |
| France..... | | | 14 | | 4,155 | | | |
| San Domingo | | 1,351 | | | | | | |
| Holland | | | 8,175 | 13,680 | | | | |
| Venezuela | 6,240 | | | | | | | |
| Belgium..... | | 10 | | 116 | | | | |
| Central America..... | | 686 | | 1,062 | 3,431 | 4,932 | 9,418 | ,074 |
| Corea..... | | | | 15 | | | | |
| Dutch Guiana..... | | | | 186 | 30 | 40 | | |
| Turkey..... | | | | 50 | | 21 | | |
| Porto Rico..... | | | | | 170 | | | |
| Panama | | | | | | | | 4,229 |
| Austria-Hungary..... | | | | | | | | 1 |
| Totals..... | 5,660,541 | 6,954,618 | 4,724,155 | 5,930,379 | 7,075,539 | 4,011,609 | 1,068,703 | 1,521,136 |

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IN MEMORIAM.

The Canadian dairy industry lost during the year one of its greatest friends and promoters, in the person of the Hon. Thomas Ballantyne, who departed this life on the 29th of June last.

Born in Peebles, Scotland, on August 13, 1829, Mr. Ballantyne came to Canada with his parents in 1850, and settled in the Township of Downie, Perth county, Ontario. He taught school for a time, but abandoned the profession and took up farming, and early saw the advantages of dairying.

Mr. Ballantyne was one of the pioneers of the factory system of cheesemaking in Canada. He was the founder of the Black Creek cheese factory, in 1866, and the name of that factory has ever since been synonymous with highest quality in Canadian Cheddar cheese. Always progressive, he would allow none but the most approved practices to be followed in his factory.

Mr. Ballantyne did not confine his interest in dairying to his own factory or district. As long as his health permitted, he was always ready to devote his time and money to any movement which had for its object the uplift of the dairy industry. No dairy convention in Western Ontario seemed to be complete without his presence. The heartiness of his greetings and the cordiality of his friendship were equalled only by the vigour and positiveness of his condemnation of anything which he believed to be against the best interests of dairying. He always knew his own mind and was ready to back his convictions against all comers.

Mr. Ballantyne by no means confined his activities to the dairy industry, for he had a long and distinguished public career. In his younger days he served in the municipal council of Downie township as reeve, and afterwards represented the riding of South Perth in the Ontario Legislature continuously for eighteen years, and from 1890 to 1895 was speaker.

THE COW TESTING ASSOCIATIONS.

INTRODUCTION.

The cow testing work continues to grow and the interest in this movement has increased during the year, but not as much as its importance would seem to warrant, especially in view of the facilities which are afforded for having the testing done with a minimum expenditure of labour and money.

The testing of dairy cows is now being carried on to a greater or less extent in all important dairying countries, but in no other instance is the government of the country giving so much assistance as the government of Canada is.

We find that a good many farmers begin the work only to drop it after a few months' trial. One cannot help thinking at times that the ultimate result might be better if the plan of the work put a larger share of the cost on the owner of the herd. A person is likely to take a keener interest in a matter of this kind if he has to bear the expense. In the United States, Denmark and other countries, the farmers pay practically the whole cost of doing the testing. There is no doubt if that plan had been followed here a much smaller number would have taken it up to begin with, but it is possible that their greater enthusiasm and keener interest would have been a better foundation on which to build.

The following tables and comparisons compiled from the records by Mr. C. F. Whitley, contain much interesting and valuable information.

GENERAL.

The work of the cow testing associations was continued on much the same lines as in previous years. A full description of the plan is published in bulletin No. 12. Members are expected to take weights and samples of each cow's milk right from the

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beginning to the end of her lactation period. Owing to various circumstances, a certain proportion of the records can be had for only six months. Although numbers of these have been received, they are not included in the accompanying tables. The great majority of the members fully understand that the complete record, not a rough guess, of each cow is necessary in order to determine which are the profitable individuals in the herd.

The testing of all samples was done free of cost to the members through this branch paying the maker at the local cheese factory or creamery. Inspectors were constantly visiting the various associations, both to exercise supervision over the testing and to awaken further interest amongst the farmers in the locality. As opportunities offered during the year meetings were called for the discussion of the association work. During the winter months each association held its regular annual meeting, attended by an officer of the Dairy Division, for a general review of the season's activities and for the election of officers.

In 1908, there were 72 regular associations and 15 smaller 'groups' organized in five provinces, with 751 members owning 7,243 cows.

The movement in favour of this co-operative work originated in 1895 in Denmark, where there are now 479 associations. There are also found 204 similar organizations in Sweden, 120 in Norway, 50 in Germany, 40 in Finland, besides many in Russia, Holland, Austria, Scotland, New Zealand and the United States.

There is scarcely any branch of farm operations receiving as much attention to day as the testing of dairy cows. The newspapers abound with references to this long neglected but vitally important undertaking.

Correspondence with the members regarding various points of the work has greatly increased, and one most encouraging feature is the number of inquiries that are received for aid in organizing associations.

A great many members, the really good dairymen, act in a missionary spirit, and endeavour to spread a knowledge of the many advantages of cow testing; these men are cordially thanked for their assistance to the efforts of the department.

The daily weighing of each cow's milk is a practice largely on the increase. Record forms are supplied on application.

INSTANCES OF THE VALUE OF RECORDING.

At Lotbinière, Que., one member with seven cows averaged 4,824 pounds of milk, and 187 pounds of fat in 1906, but in 1908, his seven cows averaged 5,674 pounds of milk, and 222 pound fat. This is an increase of over 17 per cent in the yield.

A member in the Spring Creek, Ont., association had an average yield of 4,850 pounds of milk from his eleven cows in 1906, but in 1908, the yield was 6,380 pounds or an average increase of 26 per cent.

In the St. Armand, Que., association one herd shows 4,334 pounds of milk as the average of 1906, and 5,507 pounds in 1908, an increase of 27 per cent.

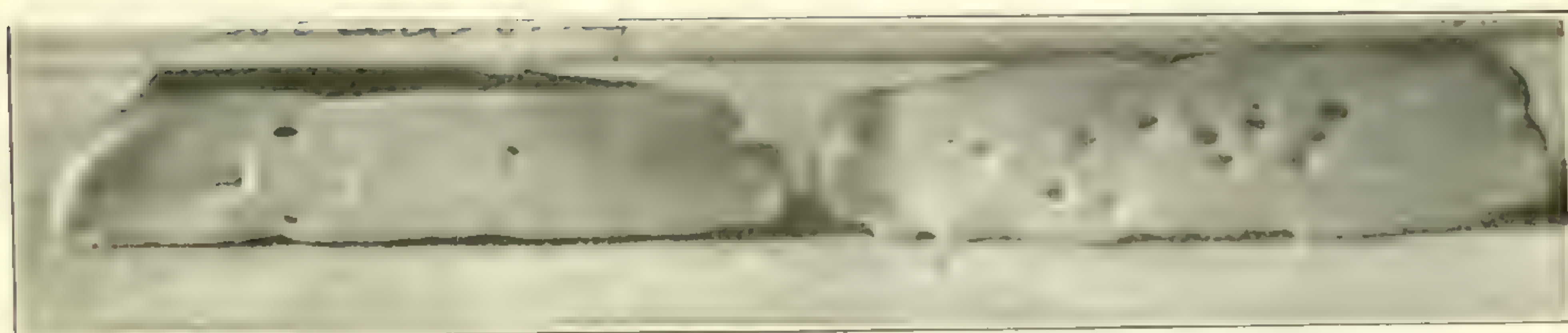
In the Mansonville, Que., association, a member shows an increased yield of milk from the eight cows in his herd, between 1906 and 1908, of 28 per cent.

Another member of the association at Lotbinière, Que., with six cows has improved from the average in 1906 of 4,012 pounds of milk to 5,344 pounds of milk in 1908, or an increase of 32 per cent.

Another herd near Harrietsville, Ont., averaged 5,374 pounds of milk per cow in 1905, but in three years there has been an increase of 34 per cent, bringing the average yield in 1908 up to 7,243 pounds of milk.

In 1906, one member at Cowansville, Que., wrote to this department, 'My cows are fed no grain, but give me two years longer and I hope to improve their milking quality considerably.' In 1908, his ten cows averaged 40 per cent more milk and fat.

One member near Woodstock, Ont., states that in 1903, he was obtaining 4,360 pounds of milk from each of his nine cows, but, having followed the lessons learned from regular weighing, he has increased the efficiency of his herd considerably, for



A

B

FIG. 1.—Showing the curd test from the evening milk treated on the Hyslop Milk Stand as follows : both milk cans were set in tubs of cold water.

'A' milk was not aerated, and the curd was clean in flavour and free from gas.

'B' milk was dipped for about 20 minutes ; the curd had quite a few gas holes, and was not as clean in flavour as the 'A' curd.

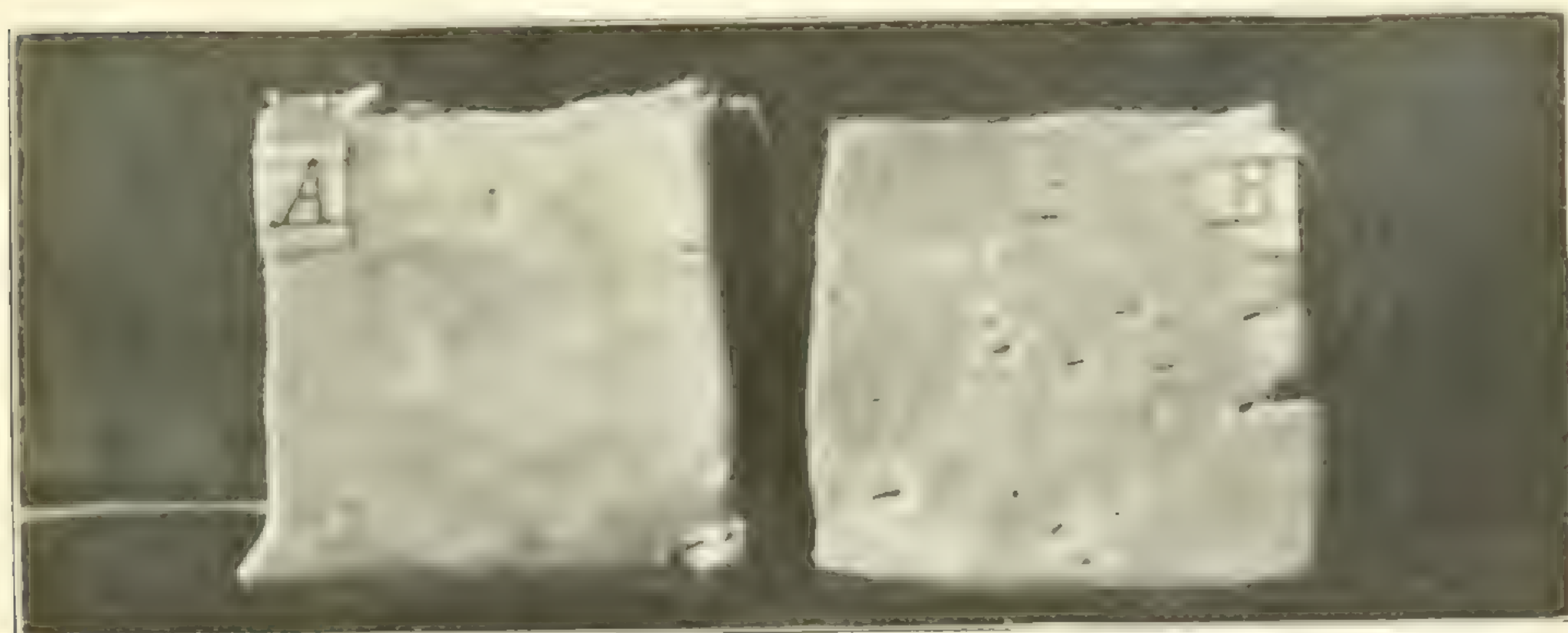


FIG. 2.—Showing the condition of the curd just before milling on August 6.

'A' curd was free from gas and clean in flavour. The milk was cooled by setting the milk cans in cold water, and was not aerated.

'B' curd was quite gassy and not clean in flavour. The milk was taken from the factory vat after all the milk was received.



FIG. 1.—Showing the condition of the curd just before milling on Aug. 7.

'A' curd was clean in flavour and free from gas. The milk was put in good cans and cooled without aeration.

'B' curd was very gassy and had a nasty dirty flavour. The milk was put into rusty cans and was not cooled or aerated.



FIG. 2.—Showing condition of curds just before milling on Aug. 11.

'A' curd was free from gas and clean in flavour. The milk was cooled to $86\frac{1}{2}^{\circ}$ immediately after milking by putting a shotgun can of water in it. When this temperature was reached the water was removed and the cover put on the can.

'B' curd was quite gassy and not clean in flavour. The milk was run over an aerator. The temperature of the milk when milking was finished was $86\frac{1}{2}^{\circ}$. The cover was then put on the can. The temperature of the air during milking was 68° .

NOTE.—Only the evening's milk was treated as stated in explanation of cuts.

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in 1908, he obtained from eleven cows an average yield of 7,006 pounds of milk. This is an increase of 60 per cent.

One member in the Milton, Ont., association writes: 'Two years ago when we began keeping records and testing, our average was not much above 3,000 pounds of milk per cow; the average now is 5,000 pounds of milk, which is an increase of 66 per cent in two years.

Another Quebec record full of encouragement for every farmer is that of a herd near St. Hyacinthe, where twenty cows had an average yield of 6,835 pounds of milk, sold at 20 cents per gallon, or \$146.70 per cow. Feed is estimated at \$50 per cow, giving a net profit of \$96.70 per cow. Three years ago the average yield of this herd was only 4,000 pounds of milk per cow. The milk of each cow is weighed daily. It has paid with this herd, and it will abundantly repay every dairy farmer.

In 1905, a herd of twenty cows near Tyrrell, Ont., had an average yield of 6,372 pounds of milk; in 1906, 7,039 pounds; in 1907, 8,325 pounds; in 1908, 8,825 pounds. The increase, therefore, between 1906 and 1908, is 2,453 pounds of milk per cow, or over 38 per cent. Viewing cash receipts, it is found that whereas in 1905 the owner was getting \$52.72 per cow, in 1908 he received \$76.76 per cow, or from the herd of twenty cows, a total of four hundred and eighty dollars more income than three years ago. Such results should satisfy every farmer that it pays to go in for cow testing.

A herd near Boston, Ont., brought in only \$23.82 as the average earning of nine cows in 1904, but in 1908, the owner received \$57.92 per cow, or considerably more than twice as much.

These instances are put on record so that dairy farmers generally may awaken to what this movement means to them personally as well as to the Dominion at large.

SOME STARTLING CONTRASTS.

In the Milton, Ont., association the total yield of two 3-year old cows in the same herd, both calved in March, for the full lactation period of eleven months stands:—

Cow A, 7,460 pounds of milk, 306.8 pounds of fat, average test 4.1.

Cow B, 4,975 pounds of milk, 188.5 pounds of fat, average test, 3.7.

This shows a difference of 2,485 pounds of milk and 118.3 pounds of fat. Presuming that butter was worth 22 cents per pound, cow A earned thirty dollars more than cow B.

In the Central Smith, Ont., association, two cows in the same herd show just the same difference, 118 pounds of fat in ten months. Both calved in April. The one with the higher yield was six years old, and the one with the lower yield ten years old. Think of it, thirty dollars more income from a cow side by side with another in the same stable! Verily, there is need of weeding-out. But to proceed.

In the Spring Creek, Ont., association, one six year old cow in eleven months gave 11,035 pounds of milk and 430 pounds of fat. Another cow of the same age gave in the same time, 6,440 pounds of milk and 226 pounds of fat. With milk at \$1 per 100 pounds, this indicates a difference in the earning power of these two cows of over forty-five dollars.

Two cows in the Central Smith association also show a difference of over forty-six dollars. One cow, age six, gave 10,615 pounds of milk and 382 pounds of fat, while a ten year old, also calved in the spring, gave only 5,950 pounds of milk and 254 pounds of fat.

Whether or not the Osler age limit is to be applied to dairy cows depends probably on the individual productive powers of the animals, for in the one herd in the Spring Creek association, is found a 2-year old that gave 8,730 pounds of milk and 324 pounds of fat in ten months, while a 16-year old gave but 5,920 pounds of milk and 214 pounds of fat.

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Two 4-year olds in the North Oxford association are in remarkable opposition ; both calved in March and milked ten months; one gave 11,945 pounds of milk and 367 pounds of fat; and the other gave 5,650 pounds of milk and 172 pounds of fat. With milk at \$1 this indicates a difference in cash receipts of almost sixty-three dollars.

The Innerkip association presents two 7-year olds; both calved in March and milked ten months; one gave 12,227 pounds of milk and 452 pounds of fat; the other contented herself with yielding 5,435 pounds of milk and 211 pounds of fat. Allowing \$1 per hundred for milk, the one cow earned sixty-seven dollars and ninety-two cents more than the other.

During May, 78 cows in the East and West Oxford association gave 74,113 pounds of milk and 2,419 pounds of fat; but 81 cows in the Milton association gave 20,000 pounds of milk and 450 pounds of fat less.

Similarly with two associations in Quebec in May: 107 cows at Marbleton gave 60,230 pounds of milk and 2,080 pounds of fat; but 111 cows at Ormstown gave 113,065 pounds of milk and 3,885 pounds of fat.

In June, 92 cows at Henryville, Que., gave 67,285 pounds of milk and 2,352 pounds of fat; while 96 cows at Bright, Ont., gave 91,365 pounds of milk and 3,206 pounds of fat.

During July, 121 cows at St. Antoine, Que., gave 85,400 pounds of milk and 3,206 pounds of fat; and 121 cows at Warsaw, Ont., gave 101,475 pounds of milk and 3,071 pounds of fat, or twenty-five thousand pounds more milk, but 135 pounds less of fat.

In August, 105 cows at Central Smith, Ont., gave 87,290 pounds of milk, containing 2,898 pounds of fat; and 103 cows at St. Armand, Que., gave only 46,805 pounds of milk and 1,910 pounds of fat.

September shows 68 cows at New Glasgow, P.E.I., giving 43,900 pounds of milk and 1,601 pounds of fat; while 67 cows at Cowansville, Que., gave 30,255 pounds of milk and 1,315 pounds of fat. During the same thirty days, 71 cows at St. George, Ont., gave 35,370 pounds of milk and 1,233 pounds of fat; and 72 cows at Black Creek, Ont., gave 59,290 pounds of milk and 2,052 pounds of fat.

In October, 178 cows at Innerkip, Ont., gave 91,350 pounds of milk, or 16,350 pounds more than the combined efforts of 181 cows at St. Bruno, St. Prosper, Jonquières, Lotbinière and Dairy Valley in the Quebec list of associations.

In November, 1908, the 624 cows that were recorded in the British Columbia associations gave a total yield of 315,771 pounds of milk, or within 230 pounds of the total yield of the 1,051 cows in the Quebec associations.

In December, 110 cows in one association in British Columbia, gave 55,305 pounds of milk; but 112 cows in a second association in the same province gave only 41,785 pounds of milk, or 13,520 pounds of milk less.

NECESSITY OF SYSTEMATIC TESTING.

In the course of a great many meetings of dairy farmers, the question frequently arises, why should my cows be tested? Probably one of the best answers to this is found in the journal of the Bath and West and Southern Counties Society (England), in an article dealing at length with the testing of a herd in 1908. Some important conclusions are: (1) 'The milk of individual cows varies within very wide limits between morning and evening, and from day to day, it being almost impossible to find any two consecutive days on which the milk of any given cow shows exactly the same composition. (2) The mixed milk of a number of cows also varies considerably from day to day. (3) These variations can be observed when there are no disturbing influences at work, such as changes of food, changes of weather, or other known causes. They cannot at present be satisfactorily explained and must be set down to the individuality of the cow.'

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Further, as bearing on the necessity for continuous testing instead of relying on a test of short duration, the record of a cow at Madison, Wisconsin, is noteworthy. In a seven days' test this cow gave twenty pounds of butter fat, but in considering the full year she stood last but one in a list of twenty-seven, and gave only \$24.99 net profit. One year even is not enough. In four successive years, one cow stood in 9th place, then 7th, then 2nd, then 26th. Such variations call for continuous records.

VARIATIONS IN HERD YIELDS.

In one British Columbia association, the average yield of 250 cows for one month was 532 pounds of milk, 4.3 test, 22.9 pounds of fat. One herd of eleven cows stands almost exactly at the average yield. One herd of nine cows averages as high as 800 pounds of milk and 35 pounds of fat, including two yields of 1,110 and 1,125 pounds of milk from two cows two months after freshening. No fewer than fourteen out of twenty-three herds and 150 out of 250 cows are below the average yield in both milk and fat.

Included in the 150 with the low average yield, are several cows of mature age that two months after freshening gave only 500 pounds of milk and 16 pounds of fat. On the other hand, several cows are included that gave over 1,000 pounds of milk two months after freshening, and several farrow cows with particularly high tests, 7 and 8 per cent of fat. The highest average is 800 pounds of milk and 35 pounds of fat. The variations run all the way from eight and a half to thirty-seven pounds of fat as the average yield of the separate herds, the one, thus, more than four times as much as the other.

These yields, it is understood, are just for one month; to estimate the variations in actual returns per cow, the full twelve months should be considered.

AVERAGE COWS AND INDIVIDUAL PROFIT.

Averages alone can never satisfy the inquiring mind of the real dairyman. In a division of this vast Dominion on a basis of the present population, it is estimated that each person would average 400 acres as his or her share. Some men own more than that; thousands do not own a square yard.

Cows differ, so do automobiles; some of the latter are built for hauling cream, some for exclusive speed, some for the height of fashion, and some for steady every-day service; that is the kind of cow the average factory patron requires, the cow that will stick faithfully to business and give every-day results for 300 days in the year. The average cow scarcely attains this standard, but the herd can be vastly improved by checking up each individual. Wisdom dictates that this be done; progress demands it; experience counsels it; and judgment accepts it, proceeding at once to take weights and samples.

In almost any month in the year when, for instance, the average yield of all the cows recorded in an association is 663 pounds of milk and 26 pounds of fat, the extremes run something like this. One herd of nine cows averages 444 pounds of milk and 18 pounds of fat, but another herd of sixteen cows averages 819 pounds of milk and 33 pounds of fat. Further, and of far more importance, is the variation between individual cows in the same herd. Thus it is found that in the herd of nine cows with the average of 444 pounds of milk, the best cow gave 990 pounds of milk and 33.6 pounds of fat, but the lowest yield was only 350 pounds of milk and 16 pounds of fat. And in the herd of sixteen cows, six individuals gave over 1,000 pounds of milk, one giving as much as 1,170 pounds, but the smallest yield was only 470 pounds.

Such examples show clearly how imperative it is for every owner of a herd of dairy cows to have definite information as to the production of each single cow in the herd. An 'average' is too indefinite altogether when individual excellence is needed.

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Average yields of herds may not appear to differ much, but when total production is considered the lesson is brought home.

In September, the total production in seven different associations ran as follows:

| | | Pounds of Milk. |
|----|--------------------------------|-----------------|
| 1. | 55 cows, New Brunswick.. . . . | 21,945 |
| 2. | 54 " Ontario.. . . . | 23,460 |
| 3. | 54 " New Brunswick.. . . . | 26,815 |
| 4. | 55 " Quebec.. . . . | 27,595 |
| 5. | 53 " New Brunswick.. . . . | 28,280 |
| 6. | 56 " Quebec.. . . . | 30,675 |
| 7. | 53 " Ontario.. . . . | 34,644 |

Thus the 53 cows in No. 7 association produced actually 12,699 pounds of milk more than the 55 cows in No. 1 during the same month.

Every farmer should be interested in recording the production of each one of his cows. Herein lies the great difference between the man who is simply keeping cows and the man who is a real dairyman. The interest taken in one's work saves from the millstone of drudgery. Record work does not imply a burden of arithmetic; but the average common cow of the country is over-burdening with her mathematics, for she adds to a man's trouble, subtracts from his physical energy, divides his powers, multiplies his labour, takes interest from his work and discounts his chance of success.

So many farmers have made the remark at meetings 'My cows are as good as the average' that a word or two on this topic seems opportune. If the owner means that his cows are 'good enough' then the statement cannot be controverted too quickly. Such a thought can only have a retarding influence. Is not improvement necessary? If there is the tendency to drift along with 'average' cows, how can there be general improvement? An average profit of \$8 or \$12 per cow is not enough. Average, or medium quality cows, animals that are not expected, apparently, to give much milk, or good rich milk, or any respectable combination of quantity and quality, are eminently unsuitable in every way for the dairymen of Canada. Supplying no incentive for improvement, cows that are merely average will keep a man contented with low yields and small cheques; harmful as they must be in their influence, and with a steady tendency to deteriorate, they are almost a curse. Because his cows bring in as much as some neighbour's, or as much as the average of the district, are such cows really 'good enough' for the ordinary farmer?

A complete reversal of this average current opinion is necessary. But the cows will not improve unless they are helped, unless the intelligence and ambition of their owners can be awakened and put into daily practice. If it is true that the scrub horse costs virtually as much to keep as the animal of good breeding, it is more emphatically true and apparent as applied to cows. Practically the same amount of work on the farm is obtained from the horse of lower breeding, but as applied to yields of milk from dairy cows the principle is of far more vital force and profitable application. Given a certain number of cows as the maximum that can be kept on a farm of a certain size, the sooner an intelligent selection of the best is made, based on the record of each one in the herd, the quicker will the cash receipts be augmented, and a solid foundation laid for the maintenance of a highly profitable herd.

A herd with a better uniform level of production should be every farmer's aim. It is perfectly evident from the fact of the extremes of production, those cows at the top and those at the bottom of the lists being so very far apart, that but very slight attention has been paid by the majority of our dairymen to this momentous issue. An 'average' is simply the cold arithmetical mean of dissimilar numbers. For instance, the average of 4, 13, 9 and 6 is the total of these four numbers divided by 4, or 8. But the two extremes in this simple list of four figures, are very far from the average 8. So it is with too many of our herds, there are some excellent individuals

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giving up to 13,000 pounds of milk, but it does not necessarily follow that the average production of the herd is 8,000 pounds.

As an illustration of what is meant by more uniform production, a herd in the Cowansville association may be referred to. During eight months of 1908 the twelve cows comprising the herd had an average production of 5,986 pounds of milk and 236 pounds of fat. The point to notice is that every single cow gave over 5,100 pounds of milk and over 210 pounds of fat. Such a herd is profitable because there are no poor individuals to eat up profits, or to pull down unduly the general average.

Another point must be noticed. In table 55, giving the production of eighteen herds of ten cows and over in Quebec, the average yield of 236 cows stands at 4,323 pounds of milk. But no fewer than 121 cows, or more than half, give less than the average. Further, actually sixteen out of the eighteen herds contain cows giving less than the average. Only two herds, therefore, are well up above the average, and show fairly uniform production. Again, just five herds are of such poor quality that every single cow in each of the five herds stands at less than the average yield of 4,323 pounds of milk. It is precisely these poor cows that it is hoped to discover by means of weighing and sampling. They persistently pull down fairly good average yields, and it is a question whether they can show any satisfactory reason for continuing to exist. If they can be improved by better handling, what a revolution it would cause in many districts if all such poor cows were even brought up to the level of only the 'average' production. We have too many of these poor cows; but let the determined effort now be made to improve.

RAPID SHRINKAGE IN MILK YIELD SHOULD BE AVOIDED.

The general opinion seems to prevail with the average farmer that because flies are bad and pasture is drying up, therefore the cows are bound to shrink heavily in the yield of milk about July and August. Methods and usages of twenty-five years ago do not necessarily aid the dairyman who to-day wants a large cheque from the factory every month, or who has contracted to supply so much milk or cream. Without entering into a discussion of all the causes of rapid shrinkage, or the remedies, suffice it to mention one item of paramount importance, the necessity of a supply of corn ensilage for summer feeding. It is invaluable.

When a cow produces 1,200 pounds of milk in June and only 870 pounds in July, indicating a shrinkage of 27 per cent, something is lacking. When another cow in the same herd drops from 765 pounds in July to 425 pounds in August, a shrinkage of 44 per cent, is it not time to think? When a third cow in the same herd falls from 960 pounds in July to 385 pounds in August, a shrinkage of 60 per cent, it surely should indicate to the owner that his cows need a few things which he ought to provide.

The persistent milker is a treasure. The habit should be induced in every way possible.

In another herd close by the one referred to above, one cow gave 916 pounds of milk in June and 797 pounds in July, a shrinkage of only 13 per cent. A second cow gave 649 pounds in June and 610 pounds in July, only 5 per cent shrinkage.

FEEDING FOR PROFIT.

When a cow is well fed she should produce milk and fat profitably. In Western Ontario is a herd that has not been noted for large production, but a little while ago the sixteen year old boy on the place begged for the special handling of one mature cow. He had an idea she would respond to good feeding. Note the result. At the date of writing, she is still milking and likely to be for a fortnight at least. Up to the present she has given over 20,000 pounds of milk with an average test of 3.2 and over 640 pounds of fat. In June, she gave over 71 pounds of butter fat and as high as 96 pounds of milk in one day. During that month, she was fed daily seven pounds

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of bran, seven pounds of oats, eight pounds of sugar beet meal, two pounds of oil meal, forty pounds of ensilage, with all the green alfalfa and pasture that she wanted. Pasture was dry very early and flies were bad, but she kept on milking because she was fed well. Did it pay? Even assuming that her feed will cost \$100 for the year, her milk has brought in \$275.

There are unquestionably scores and probably hundreds of dairy cows in the Dominion that would bring in good money for their owners if they were given the opportunity, if they were fed for production of larger quantities. Why should we jog along contentedly with cows in the 6,000, 5,000 and 4,000 pounds of milk class, when they could be fed to give 7,000, 10,000 and 15,000 pounds of milk with fat in proportion?

Too many of our cows are simply comfortably browsing in the residential section. They should be moved up to the business district of the community. Make them pay.

Whether a cow produces milk at a cost of 50 cents or \$1.30 per 100 pounds and butter fat at a cost of 10 cents or 28 cents per pound, is a matter of the utmost importance to the dairyman. It is impossible, absolutely impossible, to ascertain the cost unless records of each cow are carefully kept.

The twenty-six cows in the dairy herd at the Ontario Agricultural College, Guelph, are reported as giving an average profit of \$31.83 over cost of feed.

A member of an Ontario association writes: 'Most of our milk is retailed at 5 cents a quart, so that as our cows average 5,000 pounds of milk, we realize \$100 per cow. Estimating feed and care at \$40 per cow, we find \$60 as the average net profit per cow.'

One member in Oxford county is to be congratulated on a herd of sixty-five cows that averaged 6,210 pounds of milk which sold for \$75. The cows are not forced, but are fed liberally with oats and barley chop, bran and shorts.

For the thirty days ending July 23, 1907, fifteen cows gave 10,140 pounds of milk, which sold at 92 cents per 100 pounds, making a total of \$93.23. The average production of milk per cow was 676 pounds with a value of \$6.21. After a few weighings this farmer thought he could do much better, and he decided to feed his cows the next winter and have them freshen a little later, that is in May. He fed his cows \$15 worth of oats before putting them on pasture and got rid of some poor cows. He is still weighing, and his record for the thirty days ending July 23, 1908, shows that these fifteen cows gave 14,160 pounds milk, which brought in 91 cents per hundred pounds, giving a total of \$128.85. The average production per cow was 944 pounds of milk. The difference in the value of milk produced in July, 1907, and July, 1908, was \$35.57.

One member stated at a meeting that he had bought six cows from a dealer in December, giving \$32 for the whole six, as they had been intended for the canning factory by the dealer. The member, thinking them likely looking animals, fed them pretty well and the same six cows gave him \$300 worth of milk in seven months, and he resold them at \$28 each.

In one association in Ontario, a cow gave 9,200 pounds of milk in six months. Assuming feed cost \$21, the profit is \$71 with milk at \$1 per 100. A second cow in the association gave only 2,200 pounds of milk, and with feed charged at only \$18 made only \$4 profit. Thus the first cow gave seventeen times as much profit as the second.

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TABLE I—Average Monthly Yields, 1903.

| Month and Province. | Total Number of Cows. | AVERAGE YIELD. | | |
|----------------------------|-----------------------------|----------------|-------|-----------|
| | | Lbs. Milk. | Test. | Lbs. Fat. |
| January— | | | | |
| British Columbia | 473 | 583 | 4.1 | 24.2 |
| Ontario | 502 | 544 | 3.5 | 19.3 |
| Quebec | 217 | 346 | 4.3 | 15.1 |
| Prince Edward Island | 33 | 278 | 3.7 | 9.5 |
| General Average | 1,025 | 511 | 3.9 | 20.3 |
| February | | | | |
| British Columbia | 614 | 665 | 4.1 | 24.8 |
| Ontario | 589 | 590 | 3.5 | 20.8 |
| Quebec | 124 | 512 | 3.9 | 20.1 |
| Prince Edward Island | 29 | 245 | 3.4 | 8.5 |
| General Average | 1,356 | 580 | 3.9 | 22.7 |
| March | | | | |
| Ontario | 463 | 632 | 3.5 | 21.9 |
| British Columbia | 674 | 604 | 4.0 | 23.9 |
| Quebec | 183 | 478 | 4.1 | 19.5 |
| Prince Edward Island | 19 | 413 | 3.0 | 12.6 |
| General Average | 1,279 | 592 | 3.8 | 22.5 |
| April— | | | | |
| Ontario | 940 | 718 | 3.3 | 23.7 |
| British Columbia | 807 | 692 | 3.9 | 27.0 |
| Quebec | 601 | 544 | 3.6 | 19.8 |
| Prince Edward Island | 33 | 446 | 3.4 | 15.5 |
| General Average | 2,381 | 661 | 3.6 | 23.7 |
| May— | | | | |
| Ontario | 1,612 | 812 | 3.3 | 27.2 |
| British Columbia | 949 | 771 | 3.8 | 29.9 |
| Quebec | 1,647 | 666 | 3.7 | 24.3 |
| Prince Edward Island | 40 | 436 | 3.6 | 15.8 |
| General Average | 4,248 | 743 | 3.5 | 26.5 |
| June— | | | | |
| Ontario | 1,962 | 943 | 3.3 | 30.1 |
| Prince Edward Island | 166 | 779 | 3.5 | 27.3 |
| New Brunswick | 813 | 733 | 3.6 | 26.3 |
| British Columbia | 923 | 733 | 3.9 | 28.6 |
| Quebec | 2,526 | 725 | 3.7 | 26.8 |
| Nova Scotia | 35 | 719 | 4.1 | 29.7 |
| General Average | 6,356 | 783 | 3.5 | 28.0 |
| July— | | | | |
| Ontario | 2,149 | 760 | 3.4 | 25.3 |
| Prince Edward Island | 123 | 709 | 3.5 | 24.8 |
| Quebec | 2,424 | 626 | 3.7 | 23.5 |
| British Columbia | 921 | 624 | 4.0 | 25.2 |
| New Brunswick | 887 | 710 | 3.6 | 21.3 |
| General Average | 5,524 | 665 | 3.6 | 24.0 |
| August | | | | |
| Ontario | 2,038 | 725 | 3.4 | 25.0 |
| Prince Edward Island | 125 | 609 | 3.8 | 23.0 |
| British Columbia | 811 | 725 | 4.1 | 27.8 |
| Quebec | 2,129 | 549 | 3.9 | 22.2 |
| New Brunswick | 935 | 594 | 3.9 | 19.4 |
| General Average | 6,059 | 600 | 3.7 | 22.4 |

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TABLE I—Average Monthly Yields, 1908—*Concluded.*

| Month and Province. | Total Number of Cows. | AVERAGE YIELD. | | |
|----------------------------|-----------------------------|----------------|-------|-----------|
| | | Lbs. Milk. | Test. | Lbs. Fat. |
| September— | | | | |
| Ontario | 1,849 | 612 | 3·6 | 22·2 |
| Prince Edward Island. | 127 | 600 | 3·7 | 22·7 |
| British Columbia..... | 747 | 522 | 4·2 | 22·1 |
| Quebec | 2,041 | 515 | 4·2 | 21·0 |
| New Brunswick..... | 808 | 457 | 4·0 | 18·2 |
| General Average..... | 5,572 | 544 | 3·9 | 21·2 |
| October— | | | | |
| Ontario | 1,504 | 515 | 3·9 | 20·0 |
| Prince Edward Island | 106 | 511 | 4·0 | 20·1 |
| British Columbia..... | 662 | 492 | 4·3 | 21·1 |
| Quebec | 1,486 | 413 | 4·4 | 18·2 |
| New Brunswick..... | 489 | 393 | 4·1 | 16·1 |
| General Average | 4,247 | 461 | 4·1 | 19·1 |
| November— | | | | |
| British Columbia..... | 624 | 506 | 4·2 | 21·4 |
| Ontario..... | 897 | 451 | 3·9 | 17·4 |
| Prince Edward Island..... | 81 | 413 | 4·0 | 16·5 |
| New Brunswick..... | 172 | 338 | 4·6 | 15·7 |
| Quebec | 1,051 | 300 | 4·7 | 14·0 |
| General Average..... | 2,825 | 400 | 4·2 | 16·9 |
| December— | | | | |
| British Columbia..... | 590 | 533 | 4·1 | 22·1 |
| Ontario..... | 617 | 459 | 3·8 | 17·3 |
| Prince Edward Island..... | 76 | 415 | 4·1 | 17·3 |
| New Brunswick..... | 143 | 377 | 4·7 | 17·9 |
| Quebec | 438 | 349 | 4·5 | 15·8 |
| General Average..... | 1,864 | 448 | 4·1 | 18·5 |

These average yields for each month correspond very closely with the averages of 1907.

PERCENTAGE OF FAT.

In 1908, the number of cows tested each month in the Dominion varied from 1,025 in January to 6,626 in July, with a total of 43,518 tests made during the year. The total yields were 26,594,990 pounds of milk and 998,751 pounds of fat, or an average of 3·76 per cent of fat.

TABLE II—Average Per Cent of Fat, 1908, by Provinces.

| | Total Number of Tests. | Total Milk. | Total Fat. | Average Test. |
|---------------------------|---------------------------|-------------|------------|---------------|
| | | Lbs. | Lbs. | p.c. fat. |
| Ontario..... | 14,553 | 10,054,709 | 348,671·6 | 3·46 |
| Quebec | 14,938 | 8,327,903 | 324,944·0 | 3·90 |
| British Columbia..... | 8,795 | 5,395,521 | 217,989·4 | 4·04 |
| New Brunswick..... | 4,247 | 2,264,327 | 86,434·1 | 3·81 |
| Prince Edward Island..... | 898 | 496,910 | 18,427·3 | 3·70 |

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In this connection the following paragraph from *La Laiterie*, of April 3, 1909, is of interest:

‘About 600 dairy farmers in convention at Lille (France) have decided on the adoption of three standards of milk for sale: (1) Rich milk, containing at least 3 per cent of fat, (2) Medium milk, testing from 1 to 3 per cent of fat; (3) Poor milk, testing from 0.15 to 1 per cent of fat.’

The following table shows the average percentage of fat in milk from cows in five provinces during 1908.

TABLE III—Average Percentage of Fat, 1908.

| Month. | ONTARIO. | | QUEBEC. | | NEW BRUNSWICK. | | PRINCE EDWARD ISLAND. | | BRITISH COLUMBIA. | | TOTAL. | |
|--------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------------|---------------|-------------------|---------------|-----------------|---------------|
| | Number of Cows. | Average Test. | Number of Cows. | Average Test. | Number of Cows. | Average Test. | Number of Cows. | Average Test. | Number of Cows. | Average Test. | Number of Cows. | Average Test. |
| January... | 302 | 3.5 | 217 | 4.3 | | | 33 | 3.7 | 473 | 4.1 | 1,025 | 3.9 |
| February... | 289 | 3.5 | 124 | 3.9 | | | 29 | 3.4 | 644 | 4.1 | 1,056 | 3.9 |
| March... | 403 | 3.5 | 183 | 4.1 | | | 19 | 3.0 | 674 | 4.0 | 1,279 | 3.8 |
| April... | 94 | 3.3 | 601 | 3.6 | | | 37 | 3.4 | 807 | 3.9 | 2,381 | 3.6 |
| May... | 1,612 | 3.3 | 1,647 | 3.7 | | | 40 | 3.6 | 949 | 3.8 | 4,248 | 3.5 |
| June... | 1,962 | 3.3 | 2,526 | 3.7 | 813 | 3.6 | 106 | 3.5 | 925 | 3.9 | 6,356 | 3.5 |
| July... | 2,140 | 3.4 | 2,491 | 3.7 | 887 | 3.6 | 123 | 3.5 | 921 | 4.0 | 6,626 | 3.6 |
| August... | 2,038 | 3.4 | 2,130 | 3.9 | 935 | 3.9 | 125 | 3.8 | 811 | 4.1 | 6,039 | 3.7 |
| September... | 1,849 | 3.6 | 2,041 | 4.2 | 808 | 4.0 | 127 | 3.7 | 747 | 4.2 | 5,552 | 3.9 |
| October... | 1,504 | 3.9 | 1,486 | 4.4 | 484 | 4.1 | 106 | 4.0 | 662 | 4.3 | 4,247 | 4.1 |
| November... | 897 | 3.9 | 1,051 | 4.7 | 172 | 4.6 | 81 | 4.0 | 624 | 4.2 | 2,825 | 4.2 |
| December... | 617 | 3.8 | 438 | 4.5 | 143 | 4.7 | 76 | 4.1 | 590 | 4.1 | 1,864 | 4.1 |

Table IV—Comparative Yields for a Period of Production of 7, 8, 9, 10, 11 and 12 Months, 1908, in Five Provinces.

| Months. | ONTARIO. | | | QUEBEC. | | | BRITISH COLUMBIA. | | | NEW BRUNSWICK. | | | PRINCE EDWARD ISLAND. | | |
|---------|-----------------|------------------------|---------------|-----------------|------------------------|---------------|-------------------|------------------------|---------------|-----------------|------------------------|---------------|-----------------------|------------------------|---------------|
| | Number of Cows. | Average Yield of Milk. | Average Test. | Number of Cows. | Average Yield of Milk. | Average Test. | Number of Cows. | Average Yield of Milk. | Average Test. | Number of Cows. | Average Yield of Milk. | Average Test. | Number of Cows. | Average Yield of Milk. | Average Test. |
| 7 | 122 | Lbs. 4,529 | 3.4 | 100 | Lbs. 3,765 | 4.0 | 72 | Lbs. 4,215 | 4.0 | 73 | Lbs. 3,135 | 4.2 | 11 | Lbs. 3,710 | 3.7 |
| 8 | 187 | 5,272 | 3.5 | 271 | 4,381 | 4.0 | 63 | 4,463 | 4.0 | 2 | 4,302 | 3.3 | 13 | 4,711 | 3.7 |
| 9 | 193 | 6,073 | 3.4 | 236 | 4,918 | 4.0 | 39 | 5,057 | 4.1 | ... | ... | ... | 15 | 4,491 | 3.9 |
| 10 | 82 | 7,413 | 3.5 | 36 | 5,028 | 3.7 | 24 | 6,694 | 3.8 | ... | ... | ... | 5 | 5,538 | 3.7 |
| 11 | 18 | 6,297 | 3.5 | 2 | 6,713 | 4.1 | 15 | 6,442 | 4.4 | ... | ... | ... | ... | ... | ... |
| 12 | 11 | 7,729 | 3.5 | 11 | 6,580 | 4.3 | 54 | 7,045 | 4.2 | ... | ... | ... | 5 | 5,578 | 3.6 |
| | | | | | | | | | | | | | | | 201.0 |

This tabular statement of milk production for periods of seven to twelve months includes many cows which were still milking at the end of twelve months' continuous production.

The totals for seven, eight and nine months include cows whose records were sent in for these periods only, and are therefore not to be taken as totals of full lactation periods. Such totals are given in the following table:—

Table V—Comparative Yields of Cows for Full Period of Lactation, by Provinces, 1908.

| Number of Months. | ONTARIO. | | | QUEBEC. | | | BRITISH COLUMBIA. | | | PRINCE EDWARD ISLAND. | | |
|-------------------|-----------------|------------------------|--------------|-----------------|------------------------|--------------|-------------------|------------------------|--------------|-----------------------|------------------------|--------------|
| | Number of Cows. | Average Yield of Milk. | Average Fat. | Number of Cows. | Average Yield of Milk. | Average Fat. | Number of Cows. | Average Yield of Milk. | Average Fat. | Number of Cows. | Average Yield of Milk. | Average Fat. |
| 7 | 20 | Lbs. 4,132 | 3.5 | 6 | Lbs. 3,393 | 4.0 | 4 | Lbs. 3,266 | 3.3 | ... | ... | ... |
| 8 | 103 | 4,707 | 3.5 | 71 | 3,658 | 4.0 | 23 | 4,157 | 4.1 | 2 | 4,495 | 3.3 |
| 9 | 199 | 5,760 | 3.5 | 174 | 4,035 | 4.0 | 56 | 5,646 | 3.7 | 4 | 5,270 | 3.5 |
| 10 | 135 | 6,628 | 3.5 | 103 | 5,146 | 4.1 | 131 | 6,119 | 3.9 | 5 | 4,567 | 3.5 |
| 11 | 67 | 6,976 | 3.6 | 35 | 4,943 | 4.3 | 152 | 6,466 | 4.1 | 3 | 5,398 | 3.8 |
| 12 | 17 | 6,792 | 3.5 | 12 | 4,788 | 4.4 | 51 | 6,251 | 4.1 | ... | ... | ... |

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Table V gives at a glance some interesting comparisons between yields of cows, for the full period of lactation, in four provinces. It will be noticed that while the larger proportion of the cows tabulated for Ontario and Quebec complete their milking period in nine months, those in British Columbia extend to it ten and eleven months. These cows milking during twelve months drop below the average yield of those milking during eleven months. One full month's rest is not too much.

British Columbia cows, as may be expected in an almost exclusively creamery section, make the best average as regards yield of fat. While these averages do not disclose, in British Columbia for example, any higher yield than 6,166 pounds of milk, and 261.7 pounds of fat, several individuals gave over 300 pounds of fat, a few gave over 350 pounds of fat, while one cow is credited with 134 pounds of fat. Distinguished from these, are several that did not reach 200 pounds of fat, while one 7-year old has to her credit only 127 pounds of fat.

TABLE VI—Summary of Comparisons between Herds of Four Cows and over for a period of production of Eight Months in Three Provinces.

| PROVINCE. | Number of Herds. | Number of Cows. | AVERAGE YIELD PER COW IN EACH PROVINCE. | | | AVERAGE YIELD OF BEST COW PER PROVINCE. | | | AVERAGE YIELD OF POOREST COW PER PROVINCE. | | |
|------------------------|------------------|-----------------|---|-------|-------|---|-------|-------|--|-------|-------|
| | | | Milk. | Test. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. |
| | | | | | | | | | | | |
| British Columbia | 8 | 41 | Lbs. | | | Lbs. | | | Lbs. | | Lbs. |
| Ontario | 18 | 111 | 4,485 | 3.8 | 171.5 | 5,799 | 3.5 | 204.6 | 3,156 | 3.9 | 134.6 |
| Quebec | 32 | 197 | 5,291 | 3.4 | 184.4 | 6,377 | 3.4 | 217.5 | 4,192 | 3.6 | 152.3 |
| | | | 4,437 | 3.9 | 171.4 | 4,969 | 4.0 | 197.0 | 3,523 | 3.9 | 138.5 |

TABLE VII—Summary of Comparisons between Herds of Ten Cows and over in Three Provinces for the Full Period of Lactation.

| NAME OF PROVINCE. | Number of Herds. | Number of Cows. | AVERAGE YIELD PER COW IN EACH PROVINCE. | | | AVERAGE YIELD OF BEST COW PER PROVINCE. | | | AVERAGE YIELD OF POOREST COW PER PROVINCE. | | |
|------------------------|------------------|-----------------|---|-------|-------|---|-------|-------|--|-------|-------|
| | | | Milk. | Test. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. |
| | | | | | | | | | | | |
| British Columbia | 12 | 218 | Lbs. | | | Lbs. | | | Lbs. | | Lbs. |
| Ontario | 18 | 248 | 6,942 | 3.6 | 246.5 | 8,446 | 3.8 | 321.6 | 4,067 | 4.1 | 178.9 |
| Quebec | 18 | 256 | 5,985 | 3.5 | 211.7 | 7,703 | 3.3 | 258.3 | 4,206 | 3.7 | 156.8 |
| | | | 4,323 | 4.1 | 178.5 | 5,555 | 4.0 | 325.7 | 3,016 | 4.3 | 129.9 |

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A glance at this table reveals the excellent standing of the 218 cows in British Columbia. Though the average test is not nearly as high as in Quebec, the total yield of fat from eighteen fewer cows is 11,600 pounds more than from the 236 cows in Quebec. The difference between the average yield of the best cow in each herd (321 pounds fat) and the average yield of the poorest cow in each herd (179 pounds) is largest in British Columbia, being 142 pounds fat, as against 102 pounds fat for Ontario, and only 95 in Quebec. The average yields of the best cows only serve to emphasize the strong lead that British Columbia enjoys. The average yield of fat from the poorest cows in British Columbia is almost identical with the average yield of all the 236 cows in Quebec, 178.8 pounds of fat.

TABLE VIII—Average Production of 1,373 Cows for Full Period of Lactation in Four Provinces.

| PROVINCE. | Number of Cows. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|---------------------------------|-----------------|------------------------|---------------|-----------------------|
| Ontario..... | 541 | 5,832 | 3.5 | 205.7 |
| Quebec..... | 401 | 4,328 | 4.2 | 180.4 |
| British Columbia..... | 417 | 5,317 | 4.0 | 210.1 |
| Prince Edward Island..... | 14 | 4,932 | 3.6 | 176.1 |
| Average for four Provinces..... | 1,373 | 5,102 | 3.8 | 193.1 |

If it be granted that a cow to be profitable must yield at least 5,000 pounds of milk and 175 pounds of butter fat, then the above average of 1,373 cows cannot be counted very encouraging. At least two factors must be considered. 1st. In averages like this about half the number of cows concerned may safely be taken as falling as much below the average as the other half would be well above it. Hence lots of these cows do not any more than pay for their feed. 2nd. There are hundreds of cows whose owners do not want to have them recorded simply because the yield is known to be unsatisfactory. Our cows can do better; let us make them.

TABLE IX—Highest and Lowest Individual Records—Full Period of Lactation, 1908.

| PROVINCE. | Age of Cow. | HIGHEST YIELD. | | | LOWEST YIELD. | | | Age of Cow. |
|-------------------------|-------------|----------------|-------|-------|---------------|-------|-------|-------------|
| | | Milk. | Test. | Fat. | Milk. | Test. | Fat. | |
| | | Lbs. | | Lbs. | Lbs. | | Lbs. | |
| British Columbia..... | 9 | 14,310 | 2.8 | 397.0 | 3,445 | 3.5 | 122.1 | 7 |
| Ontario..... | 10 | 13,742 | 3.4 | 472.4 | 3,385 | 3.5 | 118.0 | 5 |
| Quebec..... | 5 | 8,554 | 3.5 | 303.5 | 2,656 | 4.8 | 16.8 | 5 |
| Prince Edward Island... | 9 | 5,827 | 3.6 | 210.3 | 3,840 | 3.5 | 134.1 | 11 |

If milk be valued at \$1 per 100 pounds, and feed be estimated at only \$35, it is somewhat a hard matter to discover where any profit accrues from the cows (not heifers) tabulated above under 'lowest yield.'

The high yields of milk and fat indicate how far the pendulum may swing in the opposite direction.

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ASSOCIATIONS IN ONTARIO.

TABLE X—Total and Average Yield of 122 Cows Tested for Seven Months, 1908.

| Associations. | Number of Cows. | Total Yield Milk. | Total Yield Fat. | Average Yield Milk. | Average Test. | Average Yield Fat. |
|----------------------------------|-----------------------|-------------------------|------------------------|---------------------------|------------------|--------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Bobcaygeon. | 6 | 24,428 | 798 5 | 4,071 | 3·2 | 133 0 |
| Black Creek | 13 | 64,189 | 2,208 9 | 4,937 | 3·4 | 169 9 |
| Bright. | 4 | 20,745 | 706 5 | 5,186 | 3·4 | 176 6 |
| Central Smith | 8 | 41,950 | 1,383 8 | 5,243 | 3·3 | 172 9 |
| Dalmeny. | 7 | 29,724 | 1,072 9 | 4,218 | 3·6 | 153 2 |
| Gamebridge | 6 | 23,599 | 780 0 | 3,933 | 3·3 | 130 0 |
| Keene | 5 | 21,284 | 746 8 | 4,257 | 3·5 | 149 3 |
| Innerkip | 16 | 78,795 | 2,847 0 | 4,906 | 3·6 | 177 9 |
| Milton | 5 | 19,250 | 620 8 | 3,850 | 3·2 | 124 1 |
| North Oxford. | 7 | 38,455 | 1,221 4 | 5,493 | 3·1 | 174 4 |
| Rockford | 3 | 13,395 | 427 7 | 4,465 | 3·1 | 142 5 |
| St. George. | 12 | 48,882 | 1,600 0 | 4,073 | 3·2 | 138 3 |
| Star | 3 | 13,542 | 425 4 | 4,514 | 3·1 | 141 8 |
| Sheffield | 8 | 33,487 | 1,124 1 | 4,198 | 3·3 | 140 5 |
| Spring Creek. | 2 | 9,819 | 338 6 | 4,909 | 3·4 | 169 3 |
| Warsaw. | 17 | 70,080 | 2,348 1 | 4,122 | 3·3 | 137 5 |
| Total and Average Yield. | 122 | 551,524 | 18,640 5 | 4,520 | 3·4 | 152 8 |

The average yield of the 122 cows recorded for seven months is thus seen to be 4,520 pounds of milk and 152·8 pounds of fat. In the alphabetical list of associations, the extremes meet; the 3,850 pounds of milk average at Milton is contrasted with 5,493 pounds at North Oxford; and the yield of 177·9 pounds of fat at Innerkip, as an average of sixteen cows, shows a better yield than the five at Milton by 53·8 pounds of fat.

The records for seven months would have to be increased somewhat to form an idea of the actual total production for the full period of lactation. A careful scrutiny of Ontario records indicates that an addition of 6 per cent of the milk and fat produced in seven months would be a liberal allowance to add. This would give 4,790 pounds of milk and 161·9 pounds of fat.

TABLE XI—Total and Average Yield of 187 Cows Tested for Eight Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Fat. |
|----------------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Bobcaygeon. | 3 | 14,230 | 495 5 | 4,743 | 3·4 | 155 1 |
| Black Creek. | 19 | 103,228 | 3,707 4 | 5,433 | 3·5 | 195 1 |
| Bright. | 5 | 31,325 | 1,132 4 | 6,279 | 3·6 | 222 5 |
| Central Smith | 17 | 99,191 | 3,326 4 | 5,834 | 3·3 | 195 6 |
| Dalmeny | 13 | 61,272 | 2,333 6 | 4,713 | 3·8 | 177 2 |
| Kerwood. | 4 | 16,890 | 602 1 | 4,222 | 3·5 | 150 5 |
| Keene | 5 | 22,880 | 798 5 | 4,576 | 3·3 | 159 7 |
| Innerkip | 16 | 79,718 | 3,013 8 | 4,982 | 3·7 | 188 3 |
| Milton. | 11 | 46,383 | 1,709 5 | 4,216 | 3·7 | 155 4 |
| Morewood. | 15 | 86,278 | 2,997 8 | 5,750 | 3·4 | 199 8 |
| North Oxford. | 8 | 47,544 | 1,596 8 | 5,943 | 3·1 | 188 3 |
| Pine Grove. | 5 | 27,544 | 1,008 7 | 5,509 | 3·6 | 201 7 |
| Rockford | 9 | 54,913 | 1,828 0 | 6,101 | 3·3 | 203 1 |
| St. George | 15 | 71,888 | 2,535 2 | 4,792 | 3·5 | 169 0 |
| Shearer | 5 | 27,730 | 915 2 | 5,546 | 3·3 | 183 0 |
| Star | 8 | 39,029 | 1,247 7 | 4,878 | 3·1 | 175 9 |
| Sheffield | 3 | 17,420 | 570 9 | 5,803 | 3·3 | 190 3 |
| Spring Creek | 3 | 16,224 | 539 2 | 5,419 | 3·3 | 179 7 |
| Warsaw. | 23 | 121,104 | 4,293 1 | 5,265 | 3·4 | 182 7 |
| Total and Average Yield. | 187 | 985,873 | 34,441 8 | 5,272 | 3·5 | 184 2 |

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The five cows at Bright average 2,054 pounds of milk more than the four at Kerwood.

If an addition of 5 per cent of the yield of milk and fat be made, so as to give the approximate yield for the full period of lactation, the figures would be 5,535 pounds of milk and 193 pounds of fat.

TABLE XII—Total and Average Yield of 153 Cows Tested for Nine Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|------------------------------|-----------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Black Creek..... | 8 | 59,300 | 1,951·8 | 7,412 | 3·2 | 243·9 |
| Bright ... | 29 | 177,157 | 6,388·2 | 6,109 | 3·6 | 220·3 |
| Culloden | 2 | 13,825 | 473·3 | 6,912 | 3·4 | 236·6 |
| Central Smith..... | 9 | 55,855 | 2,034·0 | 6,206 | 3·6 | 226·0 |
| Dalmeny..... | 2 | 11,205 | 382·1 | 5,602 | 3·4 | 191·0 |
| Innerkip..... | 24 | 136,442 | 4,563·4 | 5,685 | 3·3 | 190·1 |
| Lorneville..... | 8 | 32,125 | 1,127·5 | 4,015 | 3·5 | 140·9 |
| Milton..... | 5 | 20,610 | 795·0 | 4,122 | 3·8 | 159·0 |
| North Oxford..... | 6 | 43,165 | 1,337·7 | 7,194 | 3·0 | 222·9 |
| Pine Grove..... | 7 | 45,150 | 1,555·0 | 6,450 | 3·4 | 222·1 |
| Rockford..... | 14 | 109,091 | 3,484·3 | 7,792 | 3·2 | 248·8 |
| Shearer. | 8 | 48,659 | 1,639·4 | 6,082 | 3·3 | 204·9 |
| Star. | 6 | 32,138 | 1,085·6 | 5,356 | 3·3 | 180·9 |
| Sheffield..... | 4 | 20,204 | 767·0 | 5,051 | 3·8 | 191·7 |
| Spring Creek.. | 11 | 66,445 | 2,570·7 | 6,040 | 3·8 | 233·7 |
| Warsaw. | 10 | 57,817 | 1,947·6 | 5,781 | 3·3 | 194·7 |
| Total and Average Yield..... | 153 | 929,186 | 32,102·6 | 6,073 | 3·4 | 209·8 |

A very creditable record is made by the fourteen cows at Rockford: their yield is 1,719 pounds of milk and 39 pounds of fat above the average of the 153 cows.

TABLE XIII—Total and Average Yield of 82 Cows Tested Ten Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|-------------------------------|-----------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Black Creek ... | 8 | 59,300 | 1,951·8 | 7,412 | 3·2 | 243·9 |
| Bright | 8 | 58,810 | 2,100·2 | 7,351 | 3·5 | 262·5 |
| Innerkip..... | 19 | 131,197 | 4,586·3 | 6,905 | 3·5 | 241·3 |
| Lorneville ... | 5 | 30,384 | 1,028·2 | 6,077 | 3·4 | 205·6 |
| Milton | 6 | 37,187 | 1,417·2 | 6,198 | 3·8 | 236·2 |
| North Oxford..... | 3 | 24,960 | 757·4 | 8,320 | 3·0 | 252·4 |
| Pine Grove.. | 4 | 32,528 | 1,146·1 | 8,132 | 3·5 | 286·5 |
| Rockford | 9 | 81,557 | 2,779·6 | 9,061 | 3·4 | 308·8 |
| Star. | 5 | 30,377 | 1,064·0 | 6,075 | 3·5 | 212·8 |
| Spring Creek..... | 15 | 121,631 | 4,360·6 | 8,108 | 3·6 | 290·7 |
| Total and Average Yield. | 82 | 607,931 | 21,191·4 | 7,413 | 3·5 | 258·3 |

The nine cows at Rockford have an average yield of 2,984 pounds of milk and 103 pounds of fat in excess of the five cows at Lorneville.

If the Lorneville cows were even up to the average yield, they would have brought in \$66 more to their owner.

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TABLE XIV—Total and Average Yield of Eighteen Cows Tested Eleven Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield Milk. | Average Test. | Average Yield Fat. |
|-----------------------------------|-----------------|----------------------|---------------------|---------------------|---------------|--------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Black Creek | 2 | 24,070 | 828.5 | 12,035 | 3.4 | 414.2 |
| Lorneville | 5 | 21,830 | 771.2 | 4,366 | 3.5 | 154.2 |
| Milton | 2 | 10,725 | 441.2 | 5,362 | 4.1 | 220.6 |
| North Oxford | 2 | 16,122 | 508.9 | 8,061 | 3.1 | 254.4 |
| Star | 4 | 23,720 | 781.6 | 5,930 | 3.3 | 195.4 |
| Sheffield | 3 | 16,870 | 600.5 | 5,623 | 3.5 | 200.1 |
| Total and Average Yield | 18 | 113,337 | 3,931.9 | 6,237 | 3.5 | 218.4 |

The two cows at Black Creek are remarkably ahead of the rest in both milk and fat production.

TABLE XV—Total and Average Yield of Eleven Cows Tested Twelve Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Milk. |
|-----------------------------------|-----------------|----------------------|---------------------|------------------------|---------------|------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Milton | 6 | 38,495 | 1,392.0 | 6,415 | 3.6 | 232.0 |
| Spring Creek | 5 | 46,520 | 1,640.6 | 9,304 | 3.5 | 328.1 |
| Total and Average Yield | 11 | 85,015 | 3,032.6 | 7,729 | 3.5 | 275.7 |

This table is another example of how very unsatisfactory 'averages' sometimes are. It would not be difficult to select the better of these two herds.

TABLE XVI—Contrasts, Beaverton, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|--|-------|-------|-------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield same herd | 7,360 | 254.5 | 6 years. |
| Poorest yield | 4,530 | 175.6 | 14 " |

TABLE XVII—Comparisons between two herds in Black Creek, Ont., Association for Eight Months.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 7 | 5,895 | 3.7 | 219.6 | 10 | 6,604 | 3.4 | 224.3 | 3 | 5,070 | 3.8 | 191.5 |
| B | 7 | 4,486 | 3.5 | 157.9 | 5 | 5,924 | 3.0 | 180.3 | 3 | 3,610 | 3.7 | 135.4 |

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TABLE XVIII—Contrasts, Black Creek, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|---------------------------|-------|-------|-------------|
| | Lbs. | Lbs. | |
| 7 months, Best yield..... | 7,020 | 214·4 | 6 years. |
| " Poorest yield..... | 3,520 | 132·8 | 10 " |

TABLE XIX—Contrasts, Bobcaygeon, Ont., Association.

| | Milk. | Fat. | Age of Cow |
|-------------------------------------|-------|-------|------------|
| | Lbs. | Lbs. | |
| 7 months, same herd, Best yield.... | 5,595 | 186·8 | 10 years. |
| " " Poorest yield..... | 2,790 | 110·7 | 4 " |
| 8 months, Best yield. | 5,190 | 175·4 | 3 years. |
| " Poorest yield | 3,970 | 141·9 | 5 " |

TABLE XX—Contrasts, Brighton, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|--------------------------------------|-------|-------|-------------|
| | Lbs. | Lbs. | |
| 8 months, same herd, Best yield..... | 7,250 | 256·4 | 5 years. |
| " " Poorest yield..... | 4,010 | 209·2 | 8 " |

TABLE XXI—Comparisons between herds in Central Smith, Ont., Association for Full Period of Lactation.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|--------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 20 | 8,415 | 3·3 | 275·2 | 7 | 10,760 | 3·4 | 369·6 | 2 | 4,435 | 3·5 | 155·1 |
| B | 4 | 5,120 | 3·8 | 195·9 | - | 5,521 | 3·8 | 210·3 | - | 4,710 | 3·8 | 181·1 |
| C | 5 | 6,222 | 3·4 | 211·7 | 7 | 7,060 | 3·4 | 244·2 | 3 | 4,006 | 3·2 | 130·2 |

In herd C the 3-year-old cow gives 3,054 pounds of milk and 114 pounds of fat less than the 7-year-old in the same herd.

Such differences are indications of the necessity of ascertaining the present worth of each animal in the herd.



A Western Ontario Cheese Factory.



A combined Cheese Factory and Creamery in Quebec.

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TABLE XXII—Comparisons between two herds in Central Smith, Ont., Association, for Eight Months, 1908.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 8 | 5,893 | 3.2 | 191.2 | 8 | 7,200 | 2.9 | 212.1 | 3 | 3,300 | 3.4 | 112.3 |
| B | 5 | 5,515 | 3.4 | 180.1 | 8 | 6,950 | 3.2 | 225.3 | 12 | 4,520 | 3.6 | 163.2 |

In herd A the 8-year old cow gives 3,960 pounds of milk and 100 pounds of fat more than the 3-year-old during eight months.

TABLE XXIII—Contrasts, Central Smith, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|---|--------|-------|-------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield..... | 13,742 | 472.4 | 8 years. |
| " " poorest yield..... | 4,600 | 151.9 | 7 " |
| 8 months, best yield..... | 7,918 | 268.4 | 6 " |
| " poorest yield..... | 4,997 | 167.8 | 12 " |
| 9 months, best yield..... | 8,860 | 303.6 | 6 " |
| " poorest yield.... | 4,685 | 187.5 | 10 " |

The 7, 12 and 10-year old cows noted above seem to be producing scarcely enough to pay for the cost of feed.

Where does payment for labour, not to mention profit, appear?

TABLE XXIV—Comparisons between two herds in Culloden, Ont., Association for Full Period of Lactation.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 12 | 6,053 | 3.3 | 203.4 | 7 | 6,719 | 3.2 | 217.5 | 4 | 4,815 | 3.1 | 157.1 |
| B | 4 | 5,066 | 3.3 | 171.6 | 14 | 6,175 | 2.9 | 178.3 | 2 | 3,675 | 4.1 | 150.6 |

NOTE.—The percentage of fat of poorest cow in herd B, young heifer, compares well with poorest 4-year-old in herd A. Testing is necessary as well as weighing.

TABLE XXV—Contrasts, Dalmeny, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|--|-------|-------|-------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield.. | 7,067 | 257·7 | 3 years. |
| " " poorest yield..... | 3,239 | 123·8 | 5 " |

TABLE XXVI—Comparisons between herds in Innerkip, Ont., Association for Full Period of Lactation, 1908.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|--------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 13 | 4,831 | 3·8 | 183·6 | 6 | 6,000 | 3·4 | 202·1 | 15 | 3,024 | 3·9 | 117·7 |
| B | 13 | 5,167 | 3·8 | 199·2 | 10 | 6,400 | 3·4 | 219·0 | 3 | 2,540 | 3·4 | 85·7 |
| C | 12 | 5,752 | 3·6 | 210·5 | 8 | 6,795 | 3·6 | 243·7 | 10 | 4,953 | 3·5 | 177·3 |
| D | 7 | 4,203 | 3·9 | 163·1 | 8 | 5,135 | 3·4 | 175·2 | 3 | 2,920 | 3·5 | 103·4 |
| E | 7 | 10,377 | 3·3 | 347·5 | 7 | 12,227 | 3·7 | 452·3 | 2 | 8,528 | 3·3 | 286·3 |
| F | 5 | 5,568 | 3·1 | 174·7 | 8 | 7,190 | 3·2 | 234·8 | 2 | 3,210 | 2·8 | 90·7 |

A remarkably good showing is made by herd E; seven cows average 10,377 pounds of milk and 347·5 pounds of fat, standing head and shoulders above the other herd averages.

This herd is of fairly even production, for the poorest yield of any cow is 8,528 pounds of milk and 286 pounds of fat, considerably better than the yield of any in the column headed ‘best cow.’

TABLE XXVII—Contrasts, Innerkip, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|--|--------|-------|-------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield..... | 12,227 | 452·3 | 7 years. |
| " " poorest yield.... | 2,540 | 85·7 | 3 " |
| Full period of lactation, 2 herds, 7 cows each, best yield.. | 10,377 | 347·5 | 7 " |
| " " poorest yield . . . | 4,290 | 158·9 | 6 " |
| 10 months, best yield.. | 10,918 | 341·8 | 5 " |
| " poorest yield..... | 4,770 | 182·8 | 9 " |
| 9 months, best yield..... | 8,345 | 254·7 | 5 " |
| " poorest yield..... | 5,105 | 159·4 | 11 " |

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TABLE XXVIII—Comparisons between herds in Keene, Ont., Association for Full Period of Lactation.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW | | | |
|-------|-----------------------|---------------|-------|-------|--------------------|-------|-------|-------|----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 6 | 7,874 | 3.3 | 261.4 | 6 | 9,169 | 3.2 | 290.1 | 8 | 6,296 | 3.7 | 231.0 |
| B | 7 | 5,128 | 3.4 | 175.8 | — | 7,045 | 3.2 | 226.0 | — | 2,820 | 3.5 | 99.7 |
| C | 6 | 6,197 | 3.1 | 191.7 | 13 | 7,515 | 3.1 | 233.1 | 4 | 3,415 | 3.2 | 110.7 |
| D | 8 | 5,266 | 3.3 | 172.8 | 9 | 7,010 | 3.3 | 230.8 | 4 | 4,064 | 3.3 | 135.1 |

Between an average of 261.4 pounds of fat and 172.8 pounds of fat in herds A and D, there is a difference of 88.6 pounds. If fat is valued at only 20 cents per pound, this means a difference of at least \$17.20 income per cow during the year.

This, it will be noticed, is in a herd with a fairly good average yield and as much as 4,064 pounds of milk from the poorest cow.

TABLE XXIX—Contrasts, Lorneville, Ont., Association.

| | Milk. | Fat. | Age of Cow |
|--|-------|-------|------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield | 8,030 | 238.0 | 6 years. |
| " " poorest yield | 3,568 | 121.9 | 6 " |
| 11 months, best yield | 8,966 | 329.3 | 6 " |
| " poorest yield | 2,670 | 94.9 | 5 " |

TABLE XXX—Comparisons between two herds in Milton, Ont., Association for Full Period of Lactation.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 6 | 6,310 | 4.2 | 263.5 | 10 | 7,815 | 4.0 | 308.8 | 8 | 4,603 | 5.7 | 262.0 |
| B | 6 | 7,360 | 3.5 | 255.1 | 5 | 9,370 | 3.2 | 302.7 | 7 | 6,178 | 3.6 | 227.1 |

The average yield of milk in these two herds differs by over 1,000 pounds, but between the best and poorest cow in each herd there is a difference of over 3,000 pounds.

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TABLE XXXI—Contrasts, Milton, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|---|-------|-------|-------------|
| | Lbs. | Lbs. | |
| 7 months, best yield..... | 5,450 | 165·9 | 2 years. |
| " poorest yield..... | 1,640 | 60·4 | 5 " |
| 8 months, same herd, best yield..... | 5,840 | 199·6 | 7 " |
| " " poorest yield..... | 3,675 | 131·7 | 15 " |
| 9 months, best yield..... | 5,480 | 161·7 | 8 " |
| " poorest yield..... | 2,930 | 138·4 | 12 " |
| Full period of lactation, best yield..... | 9,370 | 302·4 | 5 " |
| " " poorest yield..... | 4,545 | 167·4 | 8 " |

The 15 and the 12-year-old cows noted above would seem to have passed their days of usefulness and profit, though now and then a high record from cows even older than these indicates that there is no hard and fast age limit; it is again the vital question of individuality.

TABLE XXXII—Comparisons between herds in North Oxford, Ont., Association for Full Period of Lactation, 1908.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|--------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 16 | 7,646 | 3·3 | 250·8 | 4 | 11,945 | 3·1 | 367·0 | 3 | 4,705 | 3·2 | 151·3 |
| B | 4 | 6,910 | 3·1 | 214·2 | 6 | 7,222 | 3·0 | 212·1 | 5 | 6,502 | 3·1 | 203·7 |
| C | 5 | 7,595 | 3·1 | 232·7 | 4 | 9,640 | 3·0 | 287·6 | 4 | 5,650 | 3·0 | 171·7 |

Such good individual cows help the average herd production considerably. The record of herd A is commendable, namely sixteen cows with an average of 7,646 pounds of milk. Many of our farmers should take heart thereby.

TABLE XXXIII—Comparisons between herds in Pine Grove, Ont., Association for Full Period of Lactation.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 6 | 5,973 | 3·4 | 202·3 | 9 | 7,565 | 3·0 | 231·1 | 8 | 5,232 | 3·4 | 176·3 |
| B | 8 | 5,107 | 3·4 | 174·7 | 7 | 5,655 | 3·5 | 200·5 | 8 | 4,160 | 3·7 | 154·3 |
| C | 8 | 3,970 | 3·2 | 126·7 | — | 4,830 | 3·1 | 150·7 | — | 3,430 | 3·0 | 100·3 |

Two thousand pounds of milk *more* as an average yield from a herd of six cows than from a herd of eight cows (herds A and C) is calculated to incite determined effort for improvement.

Between the 231 pounds of fat of the best cow and the 100·3 pounds of fat of the poorest there is a great gulf.

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TABLE XXXIV—Comparisons of two herds in Rockford, Ont., Association for Full Period of Lactation.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 7 | 6,668 | 3·0 | 203·5 | 5 | 7,620 | 3·0 | 228·0 | 4 | 4,710 | 3·1 | 146·3 |
| B | 6 | 8,617 | 3·5 | 307·1 | 4 | 9,843 | 3·6 | 342·5 | 7 | 7,477 | 3·4 | 251·6 |

The good herd average is evidently largely dependent upon having each member of the herd up to a good and uniform level of production. The poorest cow in herd B gives more butter fat than the best cow in herd A.

TABLE XXXV—Contrasts, St. George, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|--------------------------------|-------|-------|-------------|
| | Lbs. | Lbs. | |
| 8 months, best yield. | 6,726 | 241·5 | 8 years. |
| " poorest yield | 3,065 | 111·7 | 12 " |
| 7 months, best yield | 7,340 | 217·7 | 10 " |
| " poorest yield | 3,145 | 127·8 | 13 " |

TABLE XXXVI—Comparisons between herds in Spring Creek, Ont., Association for Full Period of Lactation, 1908.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|--------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | Lbs. | Lbs. | | Lbs. | Lbs. | Lbs. | | Lbs. | Lbs. | Lbs. |
| A | 10 | 6,777 | 3·6 | 243·0 | 8 | 9,534 | 3·4 | 324·3 | 3 | 5,662 | 3·7 | 189·4 |
| B | 12 | 5,575 | 3·6 | 202·9 | 10 | 9,435 | 3·2 | 303·2 | 7 | 4,300 | 4·6 | 197·1 |
| C | 13 | 7,502 | 3·7 | 276·0 | 6 | 9,824 | 3·3 | 323·1 | 10 | 4,890 | 4·5 | 210·6 |
| D | 12 | 7,049 | 3·8 | 256·0 | 8 | 9,820 | 3·3 | 330·5 | 7 | 4,040 | 3·5 | 145·0 |
| E | 14 | 5,797 | 3·8 | 219·3 | 8 | 6,775 | 3·6 | 245·1 | 10 | 4,350 | 4·0 | 172·1 |
| F | 5 | 5,286 | 3·5 | 184·4 | 10 | 6,327 | 3·2 | 205·4 | 3 | 3,740 | 3·8 | 143·8 |
| G | 4 | 6,552 | 3·7 | 244·6 | 5 | 8,330 | 4·0 | 335·4 | old. | 5,310 | 3·3 | 178·5 |
| H | 8 | 7,728 | 3·6 | 282·8 | 6 | 11,035 | 3·9 | 430·1 | 4 | 5,930 | 3·8 | 223·5 |

The average yield of herd H is almost 100 pounds of fat more than that of herd F. But even in herd H the best cow produces almost twice as much as the poorest cow.

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TABLE XXXVII—Contrasts, Spring Creek, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|--|--------|-------|-------------|
| | Lbs. | Lbs. | |
| 8 months, best yield..... | 6,238 | 186·6 | 2 years. |
| " poorest yield..... | 4,348 | 157·5 | 14 " |
| 9 months, best yield..... | 8,360 | 296·9 | 5 " |
| " poorest yield..... | 3,860 | 183·9 | 10 " |
| 10 months, same herd, best yield..... | 11,390 | 427·1 | 8 " |
| " " poorest yield..... | 7,480 | 236·0 | 7 " |
| 12 months, best yield..... | 13,890 | 444·3 | 7 " |
| " poorest yield..... | 4,400 | 193·9 | 17 " |
| Full period of lactation, same herd, best yield..... | 8,730 | 324·3 | 2 " |
| " " poorest yield..... | 3,900 | 145·5 | 15 " |
| Full period of lactation, best yield..... | 11,035 | 430·1 | 6 " |
| " poorest yield..... | 3,910 | 145·5 | 15 " |

In two cases in the above six contrasts does a 2-year-old heifer appear as the best cow in the herd, yielding considerably more than the 14 and 15-year-olds.

TABLE XXXVIII—Comparisons between herds in Warsaw, Ont., Association for Full Period of Lactation, 1908.

| Herd. | Number of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|-----------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | Lbs. | Lbs. | | Lbs. | Lbs. | Lbs. | | Lbs. | Lbs. | Lbs. |
| A | 12 | 5,654 | 3·2 | 181·1 | 9 | 6,740 | 3·2 | 216·0 | 9 | 4,700 | 3·3 | 157·5 |
| B | 4 | 5,222 | 3·3 | 173·6 | 9 | 6,330 | 3·2 | 204·8 | 6 | 4,175 | 3·3 | 140·6 |
| C | 4 | 4,293 | 3·5 | 151·6 | 8 | 5,765 | 3·0 | 173·4 | 9 | 3,753 | 3·4 | 128·8 |
| D | 8 | 4,585 | 3·5 | 163·0 | 10 | 5,115 | 3·1 | 159·1 | 3 | 3,707 | 3·9 | 145·0 |

Over one thousand pounds of milk is a large difference to find in the three cases above: (1) herd average, herds A and C, (2) best cow, herds A and D, (3) poorest cow, herds A and D.

TABLE XXXIX—Contrasts, Warsaw, Ont., Association.

| | Milk. | Fat. | Age of Cow. |
|---|-------|-------|-------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield..... | 6,740 | 216·0 | 9 years. |
| " poorest yield..... | 3,753 | 128·8 | 9 " |
| 7 months, best yield..... | 6,635 | 202·6 | 8 " |
| " poorest yield..... | 2,230 | 100·1 | 6 " |
| 9 months, best yield..... | 6,395 | 218·2 | 3 " |
| " poorest yield..... | 4,385 | 170·9 | 12 " |

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TABLE—XL—Comparisons between 18 Herds of 10 Cows and over, in the Province of Ontario, for Full Period of Lactation in 1908.

| Name of Associations. | Herd. | Number of Cows. | TOTAL YIELD OF HERD. | | | AVERAGE YIELD PER COW. | | | Average Milking Period in Months. | Average Age of Herd. | YIELD OF BEST COW. | | | YIELD OF POOREST COW. | | |
|-----------------------|-------|-----------------|----------------------|--------|------|------------------------|-------|------|-----------------------------------|----------------------|--------------------|------|------|-----------------------|------|------|
| | | | Milk. | Fat. | Lbs. | Milk. | Test. | Fat. | | | Milk. | Fat. | Lbs. | Milk. | Fat. | Lbs. |
| Central Smith | A | 20 | 168,300 | 5,504 | 8 | 8,415 | 3 | 3 | 9 | 7 | 10,760 | 369 | 6 | 4,435 | 155 | 1 |
| " | B | 10 | 52,341 | 1,772 | 1 | 5,234 | 3 | 4 | 8 | 6 | 6,455 | 220 | 0 | 4,161 | 151 | 7 |
| Culloden | A | 12 | 72,637 | 2,441 | 7 | 6,053 | 3 | 3 | 9 | 7 | 6,719 | 217 | 5 | 4,855 | 157 | 1 |
| Morewood | A | 23 | 104,649 | 3,777 | 4 | 4,550 | 3 | 6 | 8 | 6 | 5,770 | 197 | 3 | 2,216 | 81 | 5 |
| Oak Leaf | A | 21 | 99,024 | 3,515 | 6 | 4,715 | 3 | 5 | 9 | 7 | 5,561 | 188 | 7 | 3,990 | 161 | 4 |
| Shearer | A | 10 | 57,418 | 1,949 | 4 | 5,742 | 3 | 4 | 9 | 5 | 7,141 | 216 | 0 | 4,537 | 182 | 7 |
| Warsaw | A | 12 | 67,845 | 2,173 | 7 | 5,654 | 3 | 2 | 8 | 7 | 6,749 | 216 | 0 | 4,700 | 157 | 5 |
| Spring Creek | A | 10 | 67,769 | 2,430 | 3 | 6,777 | 3 | 6 | 9 | 6 | 9,534 | 321 | 3 | 5,062 | 189 | 4 |
| " | B | 12 | 66,909 | 2,434 | 6 | 5,575 | 3 | 6 | 8 | 7 | 9,135 | 303 | 2 | 4,300 | 197 | 1 |
| " | C | 13 | 77,199 | 2,767 | 2 | 5,938 | 3 | 6 | 10 | 4 | 7,410 | 245 | 2 | 4,520 | 171 | 1 |
| " | D | 13 | 97,531 | 3,587 | 7 | 7,502 | 3 | 7 | 10 | 6 | 9,824 | 323 | 1 | 4,890 | 210 | 6 |
| " | E | 12 | 84,594 | 3,191 | 7 | 7,049 | 3 | 5 | 10 | 2 | 9,820 | 330 | 5 | 4,040 | 145 | 0 |
| " | F | 14 | 80,741 | 3,070 | 9 | 5,767 | 3 | 5 | 10 | 6 | 6,775 | 245 | 1 | 4,350 | 172 | 1 |
| North Oxford | A | 16 | 122,344 | 4,013 | 5 | 7,646 | 3 | 3 | 10 | 0 | 11,945 | 367 | 0 | 4,705 | 151 | 3 |
| Innerkip | A | 13 | 62,802 | 2,387 | 7 | 4,831 | 3 | 8 | 8 | 6 | 6,000 | 202 | 1 | 3,024 | 117 | 7 |
| " | B | 13 | 67,177 | 2,589 | 6 | 5,167 | 3 | 8 | 8 | 5 | 6,400 | 219 | 0 | 2,540 | 85 | 7 |
| " | C | 12 | 65,840 | 2,379 | 2 | 5,487 | 3 | 6 | 9 | 0 | 6,105 | 220 | 9 | 4,440 | 158 | 2 |
| " | D | 12 | 69,024 | 2,526 | 3 | 5,752 | 3 | 6 | 9 | 4 | 6,795 | 243 | 7 | 4,953 | 177 | 3 |
| Averages and Totals | | 248 | 1,484,144 | 52,513 | 4 | 5,985 | 3 | 5 | | | 7,733 | 258 | 3 | 4,206 | 156 | 8 |

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In this table No. 40, comprising some statistics of eighteen herds in Ontario associations for the full period of lactation, attention is arrested by the extraordinary differences revealed in the columns of total yields of milk and fat.

The ten cows in herd B, Central Smith, gave *less than one-third* the total weight of milk produced by the twenty cows in herd A. The thirteen cows in herd D, Spring Creek, gave 34,729 pounds of milk *more* than the thirteen cows in herd A, Innerkip. The twelve cows in herd C, Innerkip, gave 18,754 pounds milk *less* than the twelve cows in herd E, Spring Creek. Considered in cash, with milk at 1 cent a pound, these differences vary from \$187 for the twelve cows, up to \$320 for the ten-cow herd. When in the same association, therefore, the difference in the income from two herds varies by as much as \$32 per cow it is assuredly high time for paying more attention to the latent possibilities of both the cows and their owners.

Eleven out of the eighteen herds average less than the 5,985 pounds of milk average yield of the 248 cows. Herd A at Central Smith is considerably above the average, with other good ones at Spring Creek and North Oxford.

The yields of the best cows also show great variations, from 5,561 pounds of milk and 188.7 pounds of fat all the way up to 11,945 pounds of milk and 369.6 pounds of fat. The low yield of 2,540 pounds of milk and only 85.7 pounds of fat from a 3-year-old does not shine in comparison.

The average yield of the poorest cow in each herd is 3,527 pounds of milk and 101.5 pounds of fat below the average yield of the best cow in each herd; in some herds this difference is greatly augmented, for instance in herd E at Spring Creek the 8-year-old best cow gives 5,780 pounds of milk and 185.5 pounds of fat *more* than the 7-year-old.

The high age of many cows in the list of poor individual yields is noteworthy. Does it not indicate that long before this some steps should have been taken to determine the production of cows 7, 9, 10 and 15 years old?

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TABLE XLI—Comparisons between Herds of Four Cows and over, in the Province of Ontario for a period of Production of Eight Months, 1908.

| Name of Associations. | Herd | Number of Cows. | TOTAL YIELD OF HERD. | | AVERAGE YIELD PER COW. | | | YIELD OF BEST COW. | | | YIELD OF POOREST COW. | | | |
|--------------------------|------|-----------------|----------------------|----------|------------------------|-------|-------|--------------------|-------|-------|-----------------------|------|-------|-------|
| | | | Milk. | Fat. | Lbs. | Milk. | Test. | Fat. | Lbs. | Milk. | Test. | Fat. | Age. | |
| | | | | | | | | | | | | | | |
| Morewood..... | A | 15 | 86,258 | 2,997.8 | Lbs. | 5,750 | 3.4 | 199.8 | 7,180 | 3.2 | 4,161 | 3.6 | 150.4 | 2 |
| North Oxford..... | A | 5 | 35,334 | 1,104.7 | | 7,067 | 3.1 | 220.9 | 8,440 | 3.0 | 6,495 | 3.2 | 208.3 | 5 |
| Innerkip..... | A | 5 | 27,047 | 885.1 | | 5,409 | 3.2 | 177.0 | 6,040 | 3.1 | 4,931 | 3.3 | 160.5 | 3 |
| "..... | B | 4 | 20,165 | 924.2 | | 5,041 | 4.5 | 231.0 | 5,745 | 4.1 | 4,455 | 3.2 | 232.9 | - |
| Kerwood..... | A | 4 | 16,890 | 602.1 | | 4,222 | 3.5 | 150.5 | 4,690 | 3.7 | 3,860 | 3.7 | 142.9 | 10 |
| Rockford..... | A | 4 | 22,106 | 769.9 | | 5,526 | 3.4 | 192.4 | 6,470 | 3.5 | 4,626 | 3.4 | 160.1 | 2 |
| Milton..... | A | 7 | 31,355 | 1,118.7 | | 4,479 | 3.5 | 159.8 | 5,385 | 3.6 | 3,675 | 3.6 | 131.7 | 15 |
| Pine Grove..... | A | 4 | 21,564 | 807.6 | | 5,391 | 3.7 | 201.9 | 6,150 | 3.3 | 4,944 | 3.4 | 166.5 | 4 |
| Black Creek..... | A | 7 | 41,265 | 1,537.2 | | 5,895 | 3.7 | 219.6 | 6,604 | 3.4 | 5,070 | 3.8 | 191.5 | 3 |
| "..... | B | 7 | 31,402 | 1,105.3 | | 4,486 | 3.5 | 157.9 | 5,924 | 3.0 | 3,610 | 3.7 | 135.4 | 3 |
| Dalmeny..... | A | 6 | 21,576 | 775.2 | | 3,596 | 3.6 | 129.2 | 4,940 | 3.7 | 2,540 | 3.3 | 85.8 | 2 |
| "..... | B | 6 | 35,646 | 1,377.6 | | 5,941 | 3.8 | 229.6 | 8,277 | 3.5 | 3,212 | 4.0 | 124.2 | 7 |
| Warsaw..... | A | 7 | 36,477 | 1,323.7 | | 5,211 | 3.6 | 189.1 | 6,400 | 3.6 | 4,389 | 3.6 | 157.7 | 8 |
| "..... | B | 7 | 36,113 | 1,239.7 | | 5,159 | 3.4 | 177.1 | 6,721 | 3.3 | 4,085 | 3.7 | 151.0 | 4 |
| "..... | C | 6 | 32,478 | 1,030.8 | | 5,413 | 3.2 | 173.3 | 6,150 | 3.2 | 4,360 | 3.6 | 156.8 | 2 |
| St. George..... | A | 4 | 16,902 | 573.0 | | 4,225 | 3.4 | 143.2 | 5,500 | 3.3 | 3,231 | 3.3 | 107.6 | 3 |
| Central Smith..... | A | 8 | 47,144 | 1,520.6 | | 5,868 | 3.2 | 191.2 | 7,260 | 2.9 | 3,500 | 3.4 | 112.3 | 12 |
| "..... | B | 5 | 27,575 | 945.5 | | 5,515 | 3.4 | 189.1 | 6,950 | 3.2 | 4,520 | 3.6 | 163.2 | |
| Averages and Totals..... | ... | 111 | 587,297 | 20,656.9 | | 5,291 | 3.4 | 184.4 | 6,377 | 3.4 | 4,192 | 3.6 | 152.3 | ..... |

The four cows at St. George give only 573 pounds of fat in eight months, or 351 pounds less than the four cows at Innerkip. Similarly the four cows at Kerwood give 5,216 pounds of milk less than the four cows at Rockford.

The average yield of milk per cow for the 111 included in this table is 5,291 pounds, but ten out of the eighteen herds are above this average, the herd of five cows at North Oxford being conspicuous with an average of 7,067 pounds. There are also ten herds that average more than 184.4 pounds of fat, that at Innerkip making a good showing of 231 pounds

While the average yield of the best cow in each herd reaches 6,377 pounds of milk and 217.5 pounds of fat, the variations amongst these best yields are surprising; it is a long drop from 8,440 pounds of milk or 294.4 pounds of fat down to 4,000 pounds of milk and 171.2 pounds of fat.

In considering the yield of the poorest cow in each herd there will be noticed a considerable difference in the yields of the five heifers. Two very promising. The one at Rockford gives a better yield than the 10-year-old at Kerwood.

TABLE XLII—The yields of 573 individual cows for periods of 7, 8, 9, 10, 11 and 12 months in Ontario Associations, are classified as follows:—

| TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | | | | | | | Total No. of Cows. | No. of Herd Represented. | No. of Associations. | |
|--------------------------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|----------------------|----------------------|----------------------|--------------------|--------------------------|----------------------|----------------------|
| Number of Months. | | 1,000 to 2,000 lb. | 2,000 to 3,000 lb. | 3,000 to 4,000 lb. | 4,000 to 5,000 lb. | 5,000 to 6,000 lb. | 6,000 to 7,000 lb. | 7,000 to 8,000 lb. | 8,000 to 9,000 lb. | 9,000 to 10,000 lb. | 10,000 to 11,000 lb. | 11,000 to 12,000 lb. | 12,000 to 13,000 lb. | | | | 13,000 to 14,000 lb. | No. of cows. |
| 7..... | 1 | 7 | 32 | 40 | 33 | 5 | 4 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 122 | 49 | 16 |
| 8..... | ..... | 2 | 22 | 53 | 62 | 37 | 7 | 4 | ..... | ..... | ..... | ..... | ..... | ..... | 187 | 58 | 19 |
| 9..... | ..... | 3 | 6 | 20 | 49 | 40 | 19 | 10 | 5 | 1 | ..... | ..... | ..... | ..... | 153 | 57 | 16 |
| 10..... | ..... | ..... | 1 | 4 | 12 | 20 | 20 | 9 | 7 | 6 | 3 | ..... | ..... | ..... | 82 | 30 | 10 |
| 11..... | ..... | 2 | 2 | 2 | 4 | 3 | 1 | 1 | 1 | ..... | 1 | ..... | ..... | ..... | 18 | 10 | 6 |
| 12..... | ..... | ..... | ..... | 1 | 1 | 4 | 2 | ..... | ..... | 1 | 1 | ..... | ..... | ..... | 11 | 4 | 2 |
| Total number of cows. | 1 | 14 | 63 | 120 | 161 | 109 | 53 | 24 | 13 | 8 | 5 | 1 | 1 | ..... | 573 | ..... | ..... |

It is satisfactory to note that out of the 573 cows included in this table 375, or 65 per cent, give yields of upwards of 5,000

pounds of milk.

Probably more would be included if the records of the 122 cows had been kept longer than seven months.

All members have been repeatedly, but are hereby again, urged to keep a record of each cow's production for the whole milking period. A knowledge of the total yield is necessary before profit can be determined.

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TABLE XLIII—The yield of 541 individual cows for Full Period of Lactation in 7, 8, 9, 10, 11 and 12 months in Ontario Associations are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | | | | | Total No. of cows. | No. of Herds Represented. | No. of Associations. |
|-----------------------|--------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|----------------------|----------------------|----------------------|----------------------|---------------------------|----------------------|
| | 1,000 to 2,000 lb. | 2,000 to 3,000 lb. | 3,000 to 4,000 lb. | 4,000 to 5,000 lb. | 5,000 to 6,000 lb. | 6,000 to 7,000 lb. | 7,000 to 8,000 lb. | 8,000 to 9,000 lb. | 9,000 to 10,000 lb. | 10,000 to 11,000 lb. | 11,000 to 12,000 lb. | 12,000 to 13,000 lb. | 13,000 to 14,000 lb. | | |
| | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | | |
| 7..... | ..... | 4 | 4 | 10 | 2 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 20 | 8 |
| 8..... | 1 | 1 | 14 | 58 | 19 | 3 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 103 | 15 |
| 9..... | ..... | 1 | 15 | 41 | 64 | 17 | ..... | ..... | 4 | 1 | ..... | ..... | ..... | 199 | 39 |
| 10..... | ..... | ..... | 3 | 18 | 37 | 14 | ..... | 16 | 10 | 2 | 1 | 1 | ..... | 135 | 67 |
| 11..... | ..... | ..... | 1 | 6 | 12 | 19 | 6 | 6 | 4 | 1 | ..... | ..... | 1 | 67 | 49 |
| 12..... | ..... | ..... | ..... | 1 | 4 | 3 | 2 | 2 | 1 | ..... | ..... | ..... | ..... | 17 | 29 |
| Total number of cows. | 1 | 6 | 37 | 134 | 136 | 114 | 56 | 20 | 19 | 4 | 3 | 1 | 1 | 541 | 10 |

All of these cows completed their lactation period in the number of months indicated. Sixty-seven per cent, or 363 out of the 541 cows in the accompanying table, give yields of over 5,000 pounds of milk. The work of these associations should speedily result in bringing a larger number into this desirable classification. This may confidently be expected, as the cows with the satisfactory records are being retained as foundation stock for good dairy herds.

TABLE XLIV—The yields in milk and fat of 27 individual 2-year-old heifers, for Full Period of Lactation in 1908, in the province of Ontario, are classified as follows:—

| Total Yield of Fat in Pounds. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | Total No. of Heifers. | No. of Herds Represented. | No. of Associations. |
|-------------------------------|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|---------------------------|----------------------|
| | 1,000 to 2,000 | 2,000 to 3,000 | 3,000 to 4,000 | 4,000 to 5,000 | 5,000 to 6,000 | 6,000 to 7,000 | 7,000 to 8,000 | 8,000 to 9,000 | | | |
| | No. of heifers. | No. of heifers. | No. of heifers. | No. of heifers. | No. of heifers. | No. of heifers. | No. of heifers. | No. of heifers. | | | |
| 75 to 100..... | 1 | 2 | 1 | | | | | | 4 | 4 | 4 |
| 100 " 125..... | | 1 | 2 | | | | | | 3 | 3 | 2 |
| 125 " 150..... | | | 2 | | | | | | 2 | 2 | 2 |
| 150 " 175..... | | | | 4 | | | | | 4 | 4 | 4 |
| 175 " 200..... | | | | 2 | 5 | | | | 7 | 6 | 5 |
| 200 " 225..... | | | | | 2 | 1 | | | 3 | 4 | 1 |
| 225 " 250..... | | | | | | | 1 | | 1 | 1 | 1 |
| 250 " 275..... | | | | | | | | 1 | 2 | 2 | 2 |
| 275 " 300..... | | | | | | | | 1 | 1 | 1 | 1 |
| 300 " 325..... | | | | | | | | | 1 | 1 | |
| Total number of heifers..... | 1 | 3 | 5 | 6 | 7 | 1 | 2 | 2 | 27 | ..... | ..... |

The twenty-seven heifers have been awarded a special tabulation in order to indicate what promising young stock there is in Ontario. There is no valid reason for remaining content with a 2,000 pound record, when twelve out of the twenty-seven heifers are seen to produce over 5,000 pounds of milk.

The good yields of butter fat are encouraging.

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ASSOCIATIONS IN QUEBEC.

TABLE XLV—Total average yield of 100 cows tested Seven Months, 1908.

| Associations. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
| Bagotville..... | 4 | 17,520 | 731.3 | 4,380 | 4.1 | 182.8 |
| Chicoutimi..... | 15 | 55,655 | 2,221.4 | 3,710 | 4.0 | 148.3 |
| Cowansville..... | 3 | 10,829 | 448.0 | 3,609 | 4.1 | 149.3 |
| Dixville..... | 6 | 22,130 | 852.1 | 3,688 | 3.8 | 142.0 |
| Dairy Valley..... | 5 | 13,867 | 493.1 | 2,773 | 3.5 | 98.6 |
| Jonquières..... | 17 | 69,740 | 2,930.7 | 4,102 | 4.2 | 172.3 |
| Marbleton..... | 3 | 7,655 | 342.3 | 2,551 | 4.4 | 114.1 |
| North Hatley..... | 6 | 20,575 | 858.3 | 3,425 | 4.1 | 143.0 |
| Ormstown..... | 17 | 74,259 | 2,707.7 | 4,368 | 3.6 | 159.2 |
| St. Antoine..... | 8 | 27,718 | 1,091.6 | 3,464 | 3.9 | 136.4 |
| St. Emélie..... | 8 | 23,065 | 973.0 | 2,883 | 4.2 | 121.6 |
| St. Armand..... | 5 | 20,405 | 745.1 | 4,081 | 3.6 | 149.0 |
| Upton..... | 3 | 12,060 | 475.1 | 4,020 | 3.9 | 158.3 |
| Totals and averages..... | 100 | 375,478 | 14,872.7 | 3,715 | 4.0 | 148.7 |

Although the average yield of the 100 cows recorded for seven months is 148.7 pounds of fat, the average of one association is as low as 98.6 pounds of fat in one case, but in another it is as high as 182.8 pounds.

TABLE XLVI—Total and average yield of 271 cows tested Eight Months, 1908.

| Associations. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
| Coaticook..... | 2 | 9,162 | 310.1 | 4,581 | 3.3 | 155.0 |
| Bagotville..... | 7 | 33,625 | 1,366.9 | 4,803 | 4.0 | 195.2 |
| Chicoutimi..... | 12 | 42,205 | 1,761.2 | 3,517 | 4.1 | 146.7 |
| Cowansville..... | 2 | 6,805 | 297.5 | 3,402 | 4.3 | 148.7 |
| Dixville..... | 8 | 30,164 | 1,294.8 | 3,770 | 4.3 | 161.8 |
| Dairy Valley..... | 6 | 20,620 | 704.9 | 3,436 | 3.4 | 117.4 |
| Henryville..... | 4 | 15,399 | 563.8 | 3,849 | 3.7 | 140.9 |
| Lotbinière..... | 9 | 41,497 | 1,660.5 | 4,610 | 4.0 | 184.5 |
| Mansonville..... | 2 | 10,340 | 450.5 | 5,170 | 4.3 | 225.2 |
| Marbleton..... | 17 | 71,223 | 2,608.4 | 4,189 | 3.6 | 153.4 |
| North Hatley..... | 10 | 41,948 | 1,631.1 | 4,194 | 3.8 | 163.1 |
| Ormstown..... | 81 | 409,788 | 15,436.7 | 5,059 | 3.7 | 190.5 |
| St. Prosper..... | 10 | 49,805 | 1,977.5 | 4,980 | 4.1 | 197.7 |
| St. Raymond..... | 7 | 28,070 | 1,221.9 | 4,010 | 4.3 | 174.5 |
| St. Edwidge..... | 3 | 12,770 | 521.6 | 4,256 | 4.1 | 173.8 |
| St. Antoine..... | 38 | 175,356 | 6,966.3 | 4,614 | 3.8 | 183.3 |
| St. Emélie..... | 18 | 59,781 | 2,508.6 | 3,321 | 4.2 | 139.3 |
| St. Armand..... | 14 | 54,043 | 2,152.4 | 3,860 | 3.9 | 153.7 |
| Upton..... | 21 | 74,643 | 3,100.4 | 3,554 | 4.1 | 147.6 |
| Totals and averages..... | 271 | 1,187,244 | 46,535.1 | 4,381 | 4.0 | 171.7 |

The average yield of milk varies from 3,321 pounds to 5,059 pounds, and the average yield of fat varies from 117.4 pounds to 225.2 pounds.

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TABLE XLVII—Total and average yield of 236 cows tested Nine Months, 1908.

| Associations. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|---------------------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Coaticook | 2 | 8,837 | 301·8 | 4,418 | 3·4 | 150·9 |
| Bagotville | 3 | 13,819 | 612·2 | 4,606 | 4·4 | 204·0 |
| Chicoutimi | 6 | 26,468 | 1,092·6 | 4,411 | 4·1 | 182·1 |
| Cowansville | 16 | 72,257 | 3,113·6 | 4,516 | 4·3 | 195·2 |
| Dixville | 15 | 69,289 | 2,766·3 | 4,619 | 4·0 | 184·4 |
| Dairy Valley | 8 | 31,165 | 1,096·2 | 3,895 | 3·5 | 137·0 |
| Henryville | 2 | 6,988 | 270·7 | 3,494 | 3·8 | 135·3 |
| Lotbinière | 29 | 144,802 | 5,706·2 | 4,993 | 3·9 | 196·7 |
| Mansonville | 2 | 10,695 | 416·0 | 5,347 | 4·2 | 223·0 |
| Marbleton | 6 | 20,827 | 788·2 | 3,741 | 3·8 | 131·3 |
| North Hatley | 8 | 38,780 | 1,476·5 | 4,847 | 3·8 | 184·5 |
| Ormstown | 29 | 187,169 | 7,130·1 | 6,454 | 3·8 | 245·8 |
| Pike River | 4 | 20,490 | 770·9 | 5,122 | 3·7 | 192·7 |
| St. Prosper | 19 | 97,320 | 3,897·5 | 5,122 | 4·0 | 205·1 |
| St. Raymond | 3 | 13,408 | 568·4 | 4,469 | 4·2 | 189·4 |
| St. Antoine | 29 | 167,562 | 6,681·1 | 5,778 | 4·0 | 230·0 |
| Ste. Emélie | 29 | 112,561 | 4,775·5 | 3,881 | 4·2 | 164·1 |
| St. Armand | 12 | 58,441 | 2,274·6 | 4,870 | 3·9 | 189·5 |
| Upton | 14 | 59,650 | 2,350·1 | 4,260 | 3·9 | 167·8 |
| Totals and averages | 236 | 1,160,528 | 46,118·5 | 4,918 | 4·0 | 195·3 |

The twenty-nine cows at St. Emelie, have a very different total yield of milk from the twenty-nine cows at Ormstown; it amounts to a weight not lightly to be disregarded, 74,608 pounds.

TABLE XLVIII—Total and average yield of 36 cows tested Ten Months, 1908.

| Associations. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|---------------------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Lotbinière | 3 | 16,905 | 712·0 | 5,635 | 4·2 | 237·3 |
| Mansonville | 2 | 10,440 | 449·9 | 5,220 | 4·3 | 224·9 |
| Marbleton | 9 | 45,165 | 1,721·2 | 5,018 | 3·8 | 191·2 |
| North Hatley | 4 | 18,225 | 751·7 | 4,556 | 4·1 | 187·9 |
| Ormstown | 2 | 15,613 | 553·9 | 7,806 | 3·5 | 276·9 |
| Ste. Emélie | 11 | 47,081 | 1,911·4 | 4,280 | 4·1 | 173·8 |
| St. Armand | 5 | 27,587 | 1,081·5 | 5,517 | 3·9 | 216·3 |
| Totals and averages | 36 | 181,016 | 7,181·6 | 5,028 | 3·7 | 199·5 |

TABLE XLIX—Total and average yield of two cows tested Eleven Months, 1908.

| | | | | | | |
|-------------------|---|--------|-------|-------|-----|-------|
| Cowansville | 2 | 13,427 | 559·5 | 6,713 | 4·1 | 279·7 |
|-------------------|---|--------|-------|-------|-----|-------|

TABLE L—Total and average yield of eleven cows tested Twelve Months, 1908.

| | | | | | | |
|----------------------|----|--------|---------|-------|-----|-------|
| Cowanville | 3 | 29,150 | 999·7 | 6,717 | 4·5 | 293·2 |
| North Hatley | 2 | 15,210 | 661·6 | 7,605 | 4·3 | 330·8 |
| St. Armand | 6 | 37,015 | 1,566·2 | 6,169 | 4·2 | 261·0 |
| Total averages | 11 | 72,375 | 3,137·5 | 6,580 | 4·3 | 285·2 |

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TABLE LI—The yields of 656 individual cows for periods of 7, 8, 9, 10, 11 and 12 months, in Quebec Associations, are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | Total No. of Cows. | No. of Herds. Repre- sented. | No. of Associ- ations. | |
|----------------------|--------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------|---------------------------------------|------------------------------|-------|
| | | | | | | | | | | | | |
| | 1,000 to 2,000 lb. | 2,000 to 3,000 lb. | 3,000 to 4,000 lb. | 4,000 to 5,000 lb. | 5,000 to 6,000 lb. | 6,000 to 7,000 lb. | 7,000 to 8,000 lb. | 8,000 to 9,000 lb. | 10,000 to 11,000 lb. | | | |
| 7 | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | 100 | 43 | 13 |
| 8 | 3 | 18 | 44 | 26 | 9 | 16 | 3 | 1 | ..... | 271 | 63 | 19 |
| 9 | ..... | 21 | 79 | 108 | 43 | 25 | 15 | 1 | ..... | 236 | 62 | 19 |
| 10 | ..... | 3 | 53 | 77 | 62 | 5 | 2 | 1 | ..... | 206 | 15 | 7 |
| 11 | ..... | ..... | 8 | 10 | 10 | 1 | ..... | 1 | ..... | 2 | 1 | 1 |
| 12 | ..... | ..... | ..... | 2 | 3 | 3 | ..... | 2 | 1 | 11 | 5 | 3 |
| Total Number of Cows | 3 | 42 | 184 | 223 | 127 | 50 | 20 | 6 | 1 | 656 | ..... | ..... |

From this table it is seen that only 204 cows, not quite one third of the 656, gave yields of over 5,000 pounds of milk. This table includes many cows which were still milking at the end of twelve months' continuous production. The totals for 7, 8, 9, 10 and 11 months include cows whose records were sent in for these periods, and are not necessarily for the full period of lactation. Such totals are given in the table following.

TABLE LII—The yields of 401 individual cows for Full Period of Lactation of 7, 8, 9, 10, 11 and 12 months, in Quebec Associations, are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | Total No. of Cows. | No. of Herds Represented. | No. of Associations. |
|----------------------------|--------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------------|----------------------|
| | 1,000 to 2,000 lb. | 2,000 to 3,000 lb. | 3,000 to 4,000 lb. | 4,000 to 5,000 lb. | 5,000 to 6,000 lb. | 6,000 to 7,000 lb. | 7,000 to 8,000 lb. | 8,000 to 9,000 lb. | |
| | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | No. of cows. | |
| 7 | 2 | 2 | 2 | 2 | ..... | ..... | ..... | ..... | 4 |
| 8 | 2 | 20 | 24 | 17 | 7 | 1 | ..... | ..... | 11 |
| 9 | 2 | 23 | 70 | 49 | 26 | 4 | ..... | ..... | 32 |
| 10 | 1 | 3 | 12 | 30 | 34 | 19 | 3 | 1 | 47 |
| 11 ..... | ..... | ..... | 6 | 16 | 9 | 2 | 2 | ..... | 32 |
| 12 ..... | ..... | ..... | 3 | 5 | 3 | 1 | ..... | ..... | 15 |
| Total number of cows. | 5 | 48 | 117 | 119 | 79 | 27 | 5 | 1 | 4 |
| | | | | | | | | | |
| | | | | | | | | | |

Thus, out of the 401 cows classified above, 119 cows, or 29 per cent, produced between 4,000 and 5,000 pounds of milk during their full period of lactation. Of these 119 cows, two were milking for seven months, seventeen for eight months, forty-nine for nine months, thirty for ten months, sixteen for eleven months, and five for twelve months.

The average period of lactation is between nine and ten months; 174 cows out of the 401 were milking for nine months and 103 for ten months.

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TABLE LIII.—The yields in milk and fat of 22 individual 2-year-old heifers for Full Period of Lactation in 1908, in the province of Quebec, are classified as follows:—

| Total Yield of Fat in Pounds. | TOTAL YIELD OF MILK IN POUNDS. | | | | | Total No. of Heifers. | No. of Herds Represented. | No. of Associations. |
|-------------------------------|--------------------------------|--------------------|--------------------|--------------------|--------------------|-----------------------|---------------------------|----------------------|
| | 1,000 to 2,000 lb. | 2,000 to 3,000 lb. | 3,000 to 4,000 lb. | 4,000 to 5,000 lb. | 5,000 to 6,000 lb. | | | |
| | No. of Heifers. | No. of Heifers. | No. of Heifers. | No. of Heifers. | No. of Heifers. | | | |
| 50 to 75 | 2 | | | | | 2 | 2 | 2 |
| 75 " 100..... | 2 | 3 | | | | 5 | 4 | 4 |
| 100 " 125..... | | 6 | | | | 6 | 5 | 5 |
| 125 " 150..... | | | 1 | | | 1 | 1 | 1 |
| 150 " 175..... | | | 3 | 2 | | 5 | 4 | 3 |
| 175 " 200..... | | | | 2 | | 2 | 2 | 1 |
| 200 " 225..... | | | | | 1 | 1 | 1 | 1 |
| Total Number of Heifers | 4 | 9 | 4 | 4 | 1 | 22 | | |

Compare these yields with those of the heifers in table 107.

The following table shows at a glance the remarkable difference in averages and total yields between herds in various localities. Between the average of 118.5 pounds of fat per cow at Dairy Valley and the 200.3 pounds of fat at St. Prosper there is a wide variation, too wide; while as regards milk, the average of 6,012 pounds per cow at Ormstown is much more satisfactory than the 3,212 pounds per cow at Chicoutimi:—

The best cows average 197 pounds of fat, but the variation is from 151.5 at Chicoutimi to 256.7 at Ormstown. And while the average yield of best cows is 4,969 pounds of milk, one cow at Ormstown is up to 7,890 pounds, which again points to the necessity of considering individual ability and performance rather than average.

The yield of the poorest cow in each of the 32 herds averages 1,446 pounds of milk less than the yields of the best cow in each herd. The difference in fat is an average of 58.5 pounds, or at least \$15 in the eight months.

Too many of the poorest yields cling round the low level of 110 pounds of fat. These cows cannot be worth keeping.

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TABLE LIV.—Comparisons between herds of Four Cows and over, in the province of Quebec, for a period of production of eight months in 1908.

| Name of Associations. | Herd No. of Cows. | TOTAL YIELD OF HERD. | | AVERAGE YIELD PER COW. | | | YIELD OF BEST COW. | | | YIELD OF POOREST COW. | | |
|--------------------------|-------------------|----------------------|----------|------------------------|-------|-------|--------------------|-------|-------|-----------------------|-------|-------|
| | | Milk. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. |
| | | | | | | | | | | | | |
| | | Lbs. | Lbs. | Lbs. | | Lbs. | Lbs. | | Lbs. | Lbs. | | Lbs. |
| Chicoutimi..... | 6 | 21,462 | 909.6 | 3,577 | 4.2 | 151.6 | 4,830 | 4.2 | 202.4 | 2,695 | 4.5 | 122.4 |
| "..... | 4 | 12,848 | 528.0 | 3,212 | 4.1 | 132.0 | 3,915 | 3.8 | 151.5 | 2,565 | 4.0 | 101.3 |
| North Hatley..... | 4 | 14,710 | 542.6 | 3,677 | 3.7 | 135.6 | 4,170 | 3.7 | 153.0 | 2,920 | 3.9 | 114.0 |
| Ragotville..... | 5 | 26,165 | 1,044.2 | 5,233 | 4.0 | 208.8 | 6,900 | 3.9 | 271.3 | 4,460 | 4.4 | 196.9 |
| St. Armand..... | 4 | 15,240 | 562.8 | 3,810 | 3.7 | 140.7 | 4,700 | 3.5 | 163.6 | 2,820 | 4.0 | 113.2 |
| "..... | 5 | 20,432 | 792.7 | 4,086 | 3.8 | 158.2 | 5,570 | 4.0 | 220.1 | 3,492 | 3.9 | 135.1 |
| Upton..... | 6 | 19,728 | 869.4 | 3,288 | 4.4 | 144.9 | 3,872 | 4.4 | 172.5 | 2,400 | 4.4 | 106.1 |
| "..... | 5 | 19,385 | 811.5 | 3,877 | 4.2 | 162.3 | 4,450 | 3.8 | 173.1 | 2,590 | 4.4 | 114.1 |
| "..... | 8 | 28,400 | 1,127.2 | 3,550 | 4.0 | 140.9 | 3,930 | 4.2 | 164.6 | 2,660 | 4.0 | 107.6 |
| Dairy Valley..... | 4 | 14,370 | 474.2 | 3,592 | 3.3 | 118.5 | 4,520 | 3.1 | 141.1 | 2,920 | 3.7 | 109.1 |
| Dixville..... | 5 | 17,500 | 776.9 | 3,500 | 4.4 | 155.4 | 4,140 | 4.1 | 170.2 | 2,780 | 4.5 | 125.9 |
| St. Antoine..... | 7 | 29,099 | 1,117.9 | 4,157 | 3.8 | 159.7 | 4,855 | 3.8 | 186.2 | 2,792 | 4.5 | 126.1 |
| "..... | 4 | 16,100 | 606.8 | 4,025 | 3.7 | 151.7 | 4,377 | 3.8 | 166.0 | 3,519 | 3.4 | 119.2 |
| "..... | 4 | 17,416 | 684.8 | 4,354 | 3.9 | 171.2 | 4,795 | 4.2 | 199.0 | 3,950 | 3.9 | 154.1 |
| "..... | 7 | 31,304 | 1,276.1 | 4,472 | 4.1 | 182.3 | 5,495 | 4.1 | 225.4 | 3,850 | 4.2 | 161.9 |
| "..... | 8 | 33,848 | 1,390.4 | 4,481 | 3.9 | 173.8 | 5,795 | 3.4 | 195.3 | 3,575 | 3.6 | 138.2 |
| Henryville..... | 4 | 15,399 | 563.8 | 3,849 | 3.7 | 140.9 | 4,300 | 3.9 | 167.0 | 3,086 | 3.7 | 115.4 |
| St. Raymond..... | 4 | 16,740 | 725.5 | 4,185 | 4.2 | 181.4 | 4,670 | 4.1 | 190.0 | 3,720 | 4.7 | 173.3 |
| Lotbiniere..... | 4 | 19,452 | 749.2 | 4,863 | 3.9 | 187.3 | 5,900 | 3.7 | 220.0 | 4,060 | 3.9 | 158.4 |
| Marbleton..... | 4 | 14,872 | 554.0 | 3,718 | 3.7 | 138.5 | 4,200 | 4.0 | 169.6 | 3,248 | 3.6 | 118.6 |
| "..... | 10 | 43,380 | 1,584.0 | 4,338 | 3.6 | 158.4 | 4,875 | 3.8 | 184.2 | 3,625 | 3.4 | 124.7 |
| St. Prosper..... | 5 | 23,310 | 930.5 | 4,662 | 4.0 | 186.1 | 5,326 | 3.9 | 208.0 | 3,654 | 4.0 | 145.3 |
| "..... | 5 | 26,495 | 1,046.5 | 5,299 | 3.9 | 209.3 | 5,930 | 4.0 | 233.1 | 4,135 | 4.1 | 167.7 |
| Ormstown..... | 8 | 48,096 | 1,578.4 | 6,012 | 3.3 | 197.3 | 7,890 | 3.2 | 255.7 | 4,440 | 3.2 | 143.8 |
| "..... | 8 | 33,064 | 1,252.8 | 4,133 | 3.8 | 156.6 | 4,760 | 4.0 | 191.1 | 3,320 | 3.2 | 105.8 |
| "..... | 5 | 27,400 | 1,112.5 | 5,480 | 4.1 | 222.5 | 6,805 | 3.7 | 256.7 | 4,230 | 4.5 | 192.0 |
| "..... | 5 | 26,340 | 914.0 | 5,268 | 3.7 | 182.8 | 6,260 | 3.2 | 199.9 | 4,640 | 3.6 | 165.7 |
| "..... | 10 | 49,990 | 2,047.0 | 4,999 | 4.1 | 204.7 | 6,050 | 3.8 | 232.6 | 4,215 | 3.9 | 163.7 |
| "..... | 12 | 52,884 | 2,076.0 | 4,407 | 3.9 | 173.0 | 4,770 | 4.1 | 194.8 | 3,650 | 4.2 | 151.6 |
| "..... | 4 | 19,352 | 749.6 | 4,838 | 3.8 | 187.4 | 5,170 | 4.0 | 204.1 | 4,351 | 3.5 | 154.5 |
| "..... | 11 | 57,717 | 2,064.7 | 5,247 | 3.6 | 187.7 | 5,725 | 3.3 | 187.3 | 4,830 | 3.6 | 175.6 |
| "..... | 12 | 59,556 | 2,299.2 | 4,963 | 3.9 | 191.6 | 7,070 | 3.6 | 251.2 | 3,250 | 4.0 | 131.8 |
| Totals and averages..... | 197 | 874,054 | 33,762.8 | 4,437 | 3.9 | 171.4 | 4,969 | 4.0 | 197.0 | 3,523 | 3.9 | 138.5 |

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TABLE IV.—Comparisons between 18 herds of ten Cows and over, in the province of Quebec, for Full Period of Lactation in 1908.

| Name of Associations. | Herd No. | No. of Cows. | TOTAL YIELD OF HERD. | | AVERAGE YIELD PER Cow. | | | YIELD OF BEST Cow. | | | YIELD OF POOREST Cow. | | |
|-----------------------|----------|--------------|----------------------|----------|------------------------|-------|-------|--------------------|-------|-------|-----------------------|-------|-------|
| | | | Milk. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Age. |
| St. Armand. | A | 17 | 74,467 | 3,116 6 | Lbs. | 4 2 | 182 3 | Lbs. | 3 5 | 274 5 | Lbs. | 3 7 | 10 |
| " | B | 18 | 81,376 | 3,095 4 | | 4 8 | 172 0 | | 3 7 | 241 0 | | 4 0 | 10 |
| " | C | 10 | 39,470 | 1,811 1 | | 4 6 | 181 1 | | 3 8 | 220 9 | | 4 8 | 10 |
| Upton | A | 12 | 49,589 | 1,581 1 | | 3 9 | 151 7 | | 3 7 | 177 1 | | 4 1 | 3 |
| Dixville | A | 19 | 82,107 | 3,759 2 | | 4 4 | 197 8 | | 4 3 | 250 8 | | 5 0 | 3 |
| Dairy Valley | A | 10 | 27,747 | 1,012 0 | | 3 6 | 101 2 | | 3 4 | 116 3 | | 4 0 | 11 |
| Chicoutimi | A | 11 | 48,212 | 1,969 7 | | 4 1 | 179 0 | | 4 2 | 217 0 | | 4 2 | 11 |
| " | B | 17 | 72,725 | 2,929 5 | | 4 0 | 171 8 | | 4 2 | 236 4 | | 4 1 | 2 |
| Bagotville | A | 25 | 133,776 | 5,552 0 | | 4 1 | 222 1 | | 4 2 | 297 8 | | 4 2 | 12 |
| " | B | 12 | 57,839 | 2,402 4 | | 4 2 | 200 2 | | 4 2 | 242 3 | | 4 3 | 4 |
| " | C | 11 | 54,159 | 2,291 0 | | 4 2 | 208 3 | | 4 1 | 244 3 | | 4 5 | 9 |
| North Hatley | A | 10 | 53,818 | 2,298 7 | | 4 1 | 220 8 | | 4 5 | 338 5 | | 4 5 | 9 |
| " | B | 10 | 35,507 | 1,402 8 | | 4 0 | 140 2 | | 3 7 | 159 0 | | 3 9 | 2 |
| Cowansville | A | 10 | 43,895 | 1,975 1 | | 4 5 | 197 5 | | 4 5 | 235 9 | | 4 8 | 6 |
| " | B | 10 | 63,542 | 2,455 2 | | 3 9 | 248 5 | | 3 6 | 303 5 | | 4 1 | 5 |
| Ste. Emélie | A | 11 | 36,409 | 1,544 6 | | 4 2 | 149 4 | | 4 1 | 157 2 | | 4 2 | 10 |
| " | B | 12 | 38,720 | 1,674 6 | | 4 3 | 159 5 | | 4 2 | 176 5 | | 4 7 | 5 |
| " | C | 11 | 33,497 | 1,406 3 | | 4 1 | 127 8 | | 4 3 | 172 7 | | 4 4 | 2 |
| Totals and averages. | | 236 | 1,029,346 | 42,202 3 | | 4 1 | 175 8 | | 4 0 | 225 7 | | 4 3 | ..... |

Low average yields affect the total production very materially. Between the herd at Dairy Valley and herd B at Cowansville there is an enormous difference; in the latter case the ten cows produced 35,795 pounds of milk and 1,473 pounds of fat more than the other ten cows. In other words one farmer received \$358 more for the milk from his ten cows for their season's production.

One of the best herds is found at Bagotville, where twenty-five cows averaged 5,351 pounds of milk and 222 pounds of fat. Large herds of good cows can be maintained if one puts intelligence into dairy farming. This herd is in a family where father and two sons own 150 cows, sending milk to a factory where thirteen patrons deliver 6,000 pounds of milk a day.

Some good individual yields even up to 8,554 pounds of milk and 338 pounds of fat, render the yield of the poorest cows the more unenviable.

Too many cows of mature age figure in the last column, indicating that there is crying need for more careful scrutiny of individual performance. Even leaving out records of the heifers, very low yields of under 3,000 pounds of milk are found, while the low yields of fat are far too conspicuous.

A fairly even herd is the one at Cowansville mentioned above, where the lowest yield is 5,389 pounds of milk and 221.5 pounds of fat: this is a higher yield than several in the 'best cow' column.

TABLE LVI.—Comparisons between Herds in Bagotville, Que., Association, for Full Period of Lactation, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 12 | 4,778 | 4.2 | 200.2 | ..... | 5,805 | 4.2 | 242.3 | 12 | 4,119 | 4.3 | 178.6 |
| B | 7 | 5,630 | 4.0 | 227.6 | ..... | 6,260 | 3.9 | 244.0 | ..... | 4,690 | 4.2 | 196.8 |

TABLE LVII.—Contrasts, Chicoutimi, Que., Association.

| | Milk. | Fat. | Age. |
|--|-------|-------|------|
| | Lbs. | Lbs. | |
| Same association, full period, best cow..... | 5,120 | 217.0 | 12 |
| poorest cow | 3,345 | 144.6 | 7 |
| Same association, 9 months, best cow..... | 5,260 | 224.7 | 10 |
| poorest cow | 3,465 | 145.0 | 1 2 |

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TABLE LVIII.—Comparisons between Herds in Cowansville, Que., Association for Full Period of Lactation, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 10 | 4,389 | 4.5 | 197.5 | 6 | 5,270 | 4.5 | 235.9 | 6 | 3,550 | 4.8 | 172.1 |
| B | 10 | 6,354 | 3.9 | 248.5 | 5 | 8,554 | 3.6 | 303.5 | 5 | 5,389 | 4.1 | 221.5 |
| C | 8 | 2,812 | 3.9 | 111.6 | | 3,627 | 3.7 | 134.2 | 2 | 1,688 | 5.3 | 89.4 |
| D | 5 | 5,996 | 4.6 | 237.7 | 7 | 6,625 | 4.3 | 284.0 | 3 | 3,825 | 4.6 | 178.0 |

Between herds B and C there is as great a contrast as can be found in any association. The owner of herd B is to be congratulated on the good average, which is chiefly the result of following the lessons to be learned from persistent weighing and sampling.

TABLE LIX.—Contrasts, Cowansville, Que., Association.

| | Milk. | Fat. | Age. |
|--|-------|-------|------|
| | Lbs. | Lbs. | |
| Full period, best cow..... | 8,554 | 303.5 | 5 |
| poorest cow..... | 2,056 | 74.1 | |
| Same herd, full period, best cow .. | 8,554 | 303.5 | 5 |
| poorest cow... | 3,550 | 172.1 | 6 |
| Same herd, 12 months' production, best cow . . | 8,300 | 358.1 | 5 |
| poorest cow..... | 5,380 | 251.3 | 3 |

TABLE LX.—Comparisons between two herds in Dairy Valley, Que., Association, for Full Period of Lactation, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A. | 10 | 2,774 | 3.6 | 101.2 | 4 | 3,390 | 3.4 | 116.3 | 2 | 1,707 | 4.0 | 69.1 |
| B. | 4 | 2,608 | 4.0 | 103.1 | 12 | 2,970 | 3.7 | 111.8 | 7 | 1,782 | 4.0 | 70.5 |

These are probably two of the poorest herds in Quebec Associations, but the owners are taking heart, because they see what is accomplished by other farmers.

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TABLE LXI.—Contrasts, Dairy Valley, Que., Association.

| | Milk. | Fat. | Age. |
|--|-------|-------|------|
| | Lbs. | Lbs. | |
| Same association, 9 months, best cow. | 5,870 | 188·2 | 4 |
| poorest co.w..... | 2,780 | 115·1 | 11 |

TABLE LXII.—Contrasts, Dixville, Que., Association.

| | Milk. | Fat. | Age. |
|--|--------|---------|------|
| | Lbs. | Lbs. | |
| Full period, same herd, best cow. | 6,540 | 269·3 | 7 |
| poorest cow..... | 2,195 | 110·8 | 7 |
| Same herd, 5 best cows..... | 28,463 | 1,191·1 | 6 |
| 5 poorest cows..... | 18,340 | 828·8 | 5 |
| Difference..... | 10,123 | 362·3 | |

TABLE LXIII.—Comparisons between two herds in Jonquières, Que., Association, for seven months.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | YIELD OF POOREST COW. | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-----------------------|-------|-------|
| | | Milk. | Test. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | Lbs. | | Lbs. | Lbs. | | Lbs. |
| A. | 12 | 4,465 | 4·2 | 185·9 | 5,400 | 4·2 | 224·7 | 3,750 | 4·1 | 155·2 |
| B. | 5 | 3,232 | 4·3 | 140·1 | 3,310 | 4·3 | 168·4 | 2,720 | 4·3 | 118·4 |

Both of these herds are capable of considerable improvement. Even herd A, so much better than herd B, has great need of lessening the difference between the yields of the best and the poorest cow.

TABLE LXIV.—Contrasts, Marbleton, Que., Association.

| | Milk. | Fat. | Age |
|--|-------|-------|-----|
| | Lbs. | Lbs. | |
| Same herd, 10 months, best cow..... | 5,050 | 201·0 | 7 |
| poorest cow | 3,680 | 122·6 | 11 |
| Same herd, 10 months, best cow..... | 6,535 | 237·2 | 6 |
| poorest cow..... | 5,012 | 180·5 | 14 |
| Same herd, 7 months, best cow..... | 3,260 | 149·7 | 3 |
| poorest cow | 1,975 | 82·3 | 3 |
| Same association, 9 months, best cow | 3,637 | 145·8 | 2 |
| poorest cow..... | 2,315 | 79·8 | 2 |
| Same association, 10 months, best cow..... | 6,535 | 237·2 | 6 |
| poorest cow .. | 3,680 | 122·6 | 11 |

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TABLE LXV.—Comparisons between herds in North Hatley, Que., Association, for Full Period of Lactation, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 10 | 5,382 | 4.1 | 220.8 | 7 | 7,475 | 4.5 | 333.5 | 9 | 4,399 | 4.5 | 196.1 |
| B | 10 | 3,550 | 4.0 | 140.2 | 6 | 4,257 | 3.7 | 159.0 | 2 | 2,754 | 3.9 | 107.9 |
| C | 6 | 3,538 | 3.8 | 134.2 | 3 | 4,590 | 3.4 | 156.7 | 3 | 2,467 | 3.8 | 93.3 |
| D | 8 | 5,922 | 3.9 | 230.8 | 9 | 6,645 | 3.6 | 239.3 | 4 | 3,500 | 4.0 | 139.3 |
| E | 8 | 4,534 | 4.1 | 186.8 | 8 | 5,925 | 4.1 | 241.8 | 3 | 3,373 | 4.0 | 133.5 |
| F | 8 | 5,142 | 4.1 | 209.2 | 6 | 6,900 | 3.8 | 266.3 | 4 | 3,765 | 4.9 | 185.7 |
| G | 5 | 3,788 | 4.3 | 163.6 | 4 | 4,705 | 4.6 | 216.8 | 3 | 2,905 | 4.2 | 122.9 |
| H | 5 | 3,272 | 4.1 | 134.3 | 5 | 3,800 | 4.3 | 164.4 | 14 | 2,510 | 3.9 | 98.3 |

The yield of the poorest cow in herd A is greater than that of the best cow in both herd B and herd H.

Valuing milk at \$1 per 100 pounds, the ten cows in herd A earned \$183.20 more than the ten cows in herd B.

In herd C the best and the poorest cow are both the same age, but the difference in their earnings is \$21.23.

The cows in herd H were dry for three months. The poorest cow in this herd, fourteen years old, has the lowest yield of any of the seventy-two in this table.

TABLE LXVI.—Contrasts in North Hatley, Que., Association, Full Period of Lactation.

| | Milk. | Fat. | Age. |
|---|-------|-------|------|
| | Lbs. | Lbs. | |
| Same herd, best cow..... | 4,590 | 156.7 | 3 |
| poorest cow..... | 2,467 | 93.3 | 3 |
| Same association, for 7 months, best cow..... | 4,890 | 193.1 | 9 |
| poorest cow..... | 2,270 | 106.5 | 8 |
| Same association, for 8 months, best cow ... | 6,890 | 289.0 | 7 |
| poorest cow..... | 3,202 | 124.9 | 15 |
| Same herd, for 10 months, best cow..... | 6,335 | 264.0 | 7 |
| poorest cow..... | 3,395 | 150.3 | 8 |

TABLE LXVII.—Comparisons between Herds in Ormstown, Que., Association, for eight months, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 8 | 6,012 | 3.3 | 197.3 | 7 | 7,890 | 3.2 | 255.7 | 4 | 4,410 | 3.2 | 143.8 |
| B | 8 | 4,133 | 3.8 | 156.6 | 8 | 4,760 | 4.0 | 191.1 | 4 | 3,320 | 3.2 | 105.8 |
| C | 5 | 5,480 | 4.1 | 222.5 | 6 | 6,805 | 3.7 | 256.7 | 6 | 4,230 | 4.5 | 192.0 |
| D | 5 | 5,268 | 3.7 | 182.8 | 5 | 6,260 | 3.2 | 199.9 | 3 | 4,640 | 3.6 | 165.7 |
| E | 10 | 4,999 | 4.1 | 204.7 | 6 | 6,050 | 3.8 | 232.6 | 10 | 4,215 | 3.9 | 163.7 |
| F | 12 | 4,407 | 3.9 | 173.0 | 4 | 4,770 | 4.1 | 194.8 | 4 | 3,650 | 4.2 | 151.6 |
| G | 4 | 4,838 | 3.8 | 187.4 | 5 | 5,170 | 4.0 | 204.1 | 5 | 4,351 | 3.5 | 154.5 |

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In this group of herds recorded for eight months there will be discerned a difference of 1,879 pounds of milk in the average yields of herds A and B. There is a wide margin between the yield of 105.8 pounds of fat from the cow in herd B and that of 256.7 pounds of fat in herd C.

TABLE LXVIII—Contrasts, Ormstown, Que., Association.

| | Milk. | Fat. | Age. |
|--|-------|-------|------|
| | Lbs. | Lbs. | |
| Same association, 7 months, best cow..... | 4,450 | 162.2 | 1½ |
| poorest cow | 3,120 | 100.9 | 3 |
| Full period of lactation, same association, best cow... .. | 7,945 | 308.9 | 7 |
| poorest cow..... | 4,108 | 141.6 | 8 |
| Same association, 8 months, best cow..... | 8,650 | 316.4 | 4 |
| poorest cow..... | 3,320 | 105.8 | 4 |

TABLE LXIX—Comparisons between Herds in St. Antoine R. R. Association, Que., for eight months, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 4 | 4,025 | 3.7 | 151.7 | 8 | 4,377 | 3.8 | 166.0 | 4 | 3,519 | 3.4 | 119.2 |
| B | 7 | 4,472 | 4.1 | 182.3 | 9 | 5,495 | 4.1 | 225.4 | 6 | 3,850 | 4.2 | 161.9 |

The larger herd shows better by comparison at every point.

TABLE LXX—Contrasts, St. Antoine, Que., Association.

| | Milk. | Fat. | Age. |
|---|-------|-------|------|
| | Lbs. | Lbs. | |
| Same association, 9 months, best cow..... | 8,160 | 339.9 | 7 |
| poorest cow..... | 3,835 | 144.0 | 6 |

TABLE LXXI—Comparisons between Herds in St. Armand, Que., Association for Full Period of Lactation, 1908.

| Herd. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 17 | 4,381 | 4.2 | 183.3 | 7 | 7,200 | 3.8 | 274.5 | 10 | 3,052 | 3.7 | 111.5 |
| B | 18 | 4,521 | 3.8 | 172.0 | 8 | 6,530 | 3.7 | 241.0 | ..... | 2,640 | 4.0 | 106.6 |
| C | 10 | 3,947 | 4.6 | 181.1 | 6 | 5,766 | 3.8 | 220.9 | 10 | 2,106 | 4.8 | 101.4 |
| D | 9 | 5,726 | 3.8 | 219.8 | 4 | 7,820 | 3.7 | 392.0 | 2 | 4,730 | 3.8 | 181.1 |

The two 10-year-old cows in this table are put to shame by the heifer in herd D. In herd A there is a difference of 4,148 pounds of milk and 163 pounds of fat between the highest and lowest yield.

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TABLE LXXII—Contrasts, St. Armand, Que., Association.

| | Milk. | Fat. | Age of Cow. |
|---|--------|-------|-------------------|
| | Lbs. | Lbs. | |
| Full period of lactation, best yield..... | 7,820 | 292·0 | 7 |
| poorest yield..... | 2,106 | 101·4 | 10 |
| 10 months, best yield..... | 7,347 | 292·5 | 5 |
| poorest yield | 3,560 | 155·9 | 4 |
| Same herd, 12 months production, best yield... .. | 10,480 | 510·5 | 9 |
| poorest yield | 4,020 | 211·5 | 11 |

This is a difference too extraordinary to be overlooked; one of the greatest to be found in any herd in any association.

Between these two cows in the same herd there is a difference of 6,460 pounds of milk and 299 pounds of fat, or over \$64 in the value of milk produced. Assuming that the first cow consumed feed to the value of \$50, she would give a profit of \$54.80. Assuming that the second cow consumed feed to the same value, her profit would be invisible, in fact a loss of \$9.80 would be apparent. Even supposing that her feed is valued at only \$40, the profit would be just 20 cents, which means that the first cow gave two hundred and seventy-four times as much profit.

If this profit were banked and the owner aimed at depositing \$1,000, it would necessitate keeping only eighteen cows like the first, but of the second kind it would take five thousand.

TABLE LXXIII --Comparisons between herds in Ste. Emélie, Que., Association for Full Period of Lactation, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 12 | 3,227 | 4·3 | 139·5 | 9 | 4,165 | 4·2 | 176·5 | 5 | 2,056 | 4·7 | 96·8 |
| B | 11 | 3,045 | 4·1 | 127·8 | ..... | 3,997 | 4·3 | 172·7 | 2 | 1,958 | 4·4 | 87·0 |
| C | 9 | 4,489 | 4·2 | 187·5 | 5 | 5,580 | 4·2 | 235·0 | 3 | 3,150 | 4·5 | 142·9 |
| D | 5 | 3,864 | 4·2 | 163·4 | 12 | 4,890 | 4·0 | 197·7 | 6 | 2,730 | 4·5 | 122·3 |
| E | 4 | 4,256 | 4·3 | 183·6 | 4 | 4,980 | 4·5 | 223·8 | 3 | 3,155 | 4·5 | 143·0 |
| F | 6 | 4,013 | 4·1 | 164·9 | 6 | 5,685 | 4·0 | 226·3 | 2 | 2,864 | 4·3 | 123·4 |
| G | 7 | 3,621 | 4·3 | 154·1 | 6 | 4,302 | 4·2 | 180·6 | 3 | 2,652 | 4·3 | 116·0 |

Herds B and C supply the contrasts in average yield of both milk and fat. An extra 1,400 pounds of milk from each cow is worth getting.

In herd A the best cow gives more than double the milk given by the poorest cow, a 5-year-old.

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TABLE LXXIV—Contrasts, Ste. Emélie Association.

| | Milk. | Fat. | Age. |
|--|-------|-------|------|
| | Lbs. | Lbs. | |
| Full period of lactation, 1908, best cow | 5,685 | 226·3 | 6 |
| poorest cow | 2,056 | 96·8 | 5 |
| Same association, 9 months, best cow | 5,430 | 234·7 | 10 |
| poorest cow | 3,138 | 133·9 | 5 |

TABLE LXXV—Comparisons between two herds in St. Prosper Association, Que., for nine months, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lqs. | | Lbs. | | Lbs. |
| A | 11 | 5,668 | 4·0 | 225·1 | 8 | 7,980 | 4·2 | 332·1 | 5 | 4,635 | 4·0 | 181·1 |
| B | 6 | 4,169 | 4·0 | 168·0 | 12 | 4,375 | 4·2 | 183·0 | 4 | 3,775 | 4·0 | 152·6 |

The best cow in herd A gives actually 4,205 pounds of milk and 179·5 pounds of fat more than the poorest in herd B during nine months. This is a difference of at least \$42.

TABLE LXXVI—Contrast, eight months, St. Edwidge, Que., Association.

| | Milk. | Fat. | Age. |
|---------------------------|-------|-------|------|
| | Lbs. | Lbs. | |
| Same herd, best cow | 6,000 | 254·1 | 6 |
| poorest cow | 2,740 | 109·7 | 5 |

TABLE LXXVII—Contrast, eight months, Henryville, Que., Association.

| | Milk. | Fat. | Age. |
|---------------------------|-------|-------|------|
| | Lbs. | Lbs. | |
| Same herd, best cow | 4,300 | 167·0 | 5 |
| poorest cow | 3,086 | 115·4 | 9 |

TABLE LXXVIII—Comparisons between herds in Ste. Emélie, Que., Association, for nine months, 1908.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 8 | 3,859 | 4·1 | 160·0 | ..... | 4,130 | 4·2 | 175·0 | ..... | 3,600 | 4·1 | 147·8 |
| B | 4 | 4,121 | 4·2 | 172·9 | 6 | 4,865 | 4·1 | 199·6 | 5 | 3,138 | 4·2 | 133·9 |
| C | 4 | 5,162 | 4·0 | 206·6 | 10 | 5,430 | 4·3 | 234·7 | 9 | 4,450 | 4·2 | 187·8 |
| D | 6 | 3,645 | 4·3 | 157·4 | 8 | 4,109 | 4·1 | 169·6 | 7 | 3,285 | 4·5 | 149·0 |

The poorest cow in herd C is better than the best cow in both herd A and herd D in both milk and fat.

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TABLE LXXIX—Comparisons between two herds in Upton Association, Que., for nine months, 1903.

| Herd No. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|----------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 5 | 4,810 | 3·8 | 184·6 | 8 | 6,020 | 3·6 | 219·5 | 2 | 3,610 | 4·0 | 146·2 |
| B | 6 | 3,770 | 4·0 | 150·1 | 8 | 4,230 | 3·9 | 166·3 | 3 | 3,160 | 3·5 | 109·9 |

Note the high percentage of fat in the milk of the poorest cow in herd A; and the great difference between the best cow in herd A and the best cow in herd B.

TABLE LXXX—Contrasts, Upton, Que., Association.

| | Milk. | Fat. | Average Age. |
|---|--------|-------|--------------|
| | Lbs. | Lbs. | |
| Same herd, full period of lactation, 3 best cows..... | 13,170 | 492·7 | 6 |
| 3 poorest cows | 9,640 | 359·3 | 5 |
| Difference | 3,530 | 133·4 | |

The three best cows in the herd produced 3,530 pounds of milk and 133·4 pounds of fat more than the three poorest.

Every herd of dairy cows in Canada should be checked up in some such way.

TABLE LXXXI—Showing the number of cows in each of 18 herds in Quebec that are below the average yield of milk and fat.

| Total number of cows in each of 18 herds of 10 cows and over in Quebec giving Less than the average yield of 4,323 lbs. Milk. | | | | Total number of cows in each of 18 herds of 10 cows and over in Quebec giving Less than the average yield of 178·8 lbs. Fat. | | |
|---|-----------------------|--|-------------------------------|--|-----------------------|----------|
| Herd No. | Name of Associations. | Number of cows in each herd that are below the average in MILK. | Total Number of Cows in Herd. | Number of cows in each herd that are below the average in FAT. | Name of Associations. | Herd No. |
| 1 | Bagotville | 1 | 25 | 3 | Bagotville.... | 1 |
| 2 | " | 2 | 12 | 2 | " | 2 |
| 3 | " | 2 | 11 | 1 | " | 3 |
| 4 | Chicoutimi | 5 | 11 | 7 | Chicoutimi.... | 4 |
| 5 | " | 8 | 17 | 11 | " | 5 |
| 6 | Cowansville | 3 | 10 | 3 | Cowansville.... | 6 |
| 7 | " | None. | 10 | None. | " | 7 |
| 8 | Dairy Valley | 10 | 10 | 10 | Dairy Valley.... | 8 |
| 9 | Dixville | 9 | 19 | 5 | Dixville | 9 |
| 10 | North Hatley..... | None. | 10 | None. | North Hatley.... | 10 |
| 11 | " | 10 | 10 | 10 | " | 11 |
| 12 | St. Armand..... | 8 | 17 | 6 | St. Armand..... | 12 |
| 13 | " | 8 | 18 | 12 | " | 13 |
| 14 | " | 6 | 10 | 5 | " | 14 |
| 15 | Ste. Emelie..... | 11 | 11 | 11 | Ste. Emelie.... | 15 |
| 16 | " | 12 | 12 | 12 | " | 16 |
| 17 | " | 11 | 11 | 11 | " | 17 |
| 18 | Upton..... | 11 | 12 | 12 | Upton | 18 |
| Totals..... | | 117 | 236 | 121 | | |

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This table, No. 81, is compiled to indicate the varying degrees of efficiency of the different herds. At North Hatley, for example, are two herds in great contrast; in one, there are no cows giving less than the average yield in either milk or fat, while in the other, every single cow is below the average.

The three herds at Ste. Emélie make a poor showing, while those at Bagotville are evidently on a much better level of production. One herd of ten cows at Cowansville shows up well, with each cow in the herd giving more than the average.

The totals show that more than half of the 236 cows give less than the average yield of 178.8 pounds of fat.

Similar compilations of eighteen herds in Ontario reveal about the same conditions. The average yield of 248 cows comprising eighteen herds of ten cows and over is 5,985 pounds of milk and 211.7 pounds of fat. The totals show that more than half of the 248 cows gave less than 5,985 pounds of milk. But what is more important is the standing of many herds, some having every cow giving less than the average, in either milk or fat; others again, herds of thirteen and twenty cows, having only one cow giving less than the average. Such herds are brilliant examples of what may be accomplished by systematically weeding out the poor individuals.

A similar summary of twelve herds of ten cows and over, in British Columbia, reveals 115 out of 218 cows giving less than the average of 6,942 pounds of milk and 246.8 pounds fat. While this average yield of medium size herds is larger than either Ontario or Quebec, the separate herds do not stand so well in comparison: for which the exception of one herd, all the other eleven herds have from one half to four-fifths of the individual cows falling below the average production.

This, again, goes to support the statement that frequently good herd averages are materially helped by one or two brilliant individuals, but those same herds are often the very ones still harbouring one or two particularly undeserving and unproductive individuals.

WHAT 'WEEDING OUT' INVOLVES.

By following systematic weighing and testing, the owner of a herd is enabled to discover (1) if each cow is paying a profit and (2) which cows pay the most profit. Occasionally a sweeping change in the composition of the herd is demanded.

For instance in a herd at Dairy Valley, Que., the total yield of ten cows in 1908 was 27,747 pounds of milk. Allowing \$1 per 100 pounds, the total income is \$277.47. The owner's estimate of feed was two tons corn fodder at \$3, 1½ tons hay at \$10, pasture, \$6, grain (oats, corn and barley) \$6, or a total of \$33 per cow. With a cost therefore of \$330 for feed and an income of \$277.47 for milk it is difficult to discover anything but a total dead loss as the result of the year's work. The two best cows in the herd gave yields of only 3,320 pounds, and 3,345 pounds of milk, which seem to indicate profits of only 90 cents and 45 cents respectively.

While the true dairy farmer who is looking for large yields of milk and butter fat at a low cost is not keeping the dual purpose cow of controversy and debate (the cow that will give a fair quantity of milk and that will produce calves that can be profitably grown into beef), he should be feeding his dairy herd with this dual purpose constantly in mind. 1st, to make each individual cow produce up to her full economical capacity; 2nd, to make each cow return a good profit. In the realization of this ideal will be found true economy and unbounded satisfaction.

Many of our best farmers are now dairying because they find it more remunerative than when they were raising beef. One herd in Ontario might be referred to where originally heavy beef animals were the rule, but now the purely 'butter cow' is kept: 40 grades averaged 330 pounds of butter; one cow has given 500 pounds of butter for three years. In addition to sales of butter, pork brought in \$1,470 last year. A member in Quebec, with 20 grades, also sold over \$700 worth of pork in 1908.

To bring any herd up to a state of high efficiency there must be continuous culling of the poorest individuals, and breeding for a higher standard.

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It is comparatively easy, that is, it has been done by many farmers, to bring a herd of grade cows up to a yield of 300 pounds of butter from a yield of 240 pounds inside six or seven years, by first of all dispensing with the use of the immature and low grade sire, and using only a bull from dairy stock; second, by constant weighing and testing so as to know which culls to sell.

The two following tables of two herds at St. Emélie, Que., indicate that by weeding out the poorest cows there is an increase in the profit per cow, a saving of feed and a saving of labour.

If these, and other, cows were fed more liberally, what are they capable of producing?

TABLE LXXXII.—Showing the increased Profit, the saving in Labour and the saving in Feed by disposing of the cows giving Less than 3,500 pounds of milk for the Full Period of Lactation.

| 12 Cows. | | | | | | | | | |
|---------------|------|--------|-------|---------|--------------------------------|--------|-------|-----------|------|
| Cow Number. | Age. | Milk. | Test. | Fat. | Period of lactation in months. | Milk. | Test. | Fat. | Age. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | |
| 1 | 4 | 3,530 | 4 3 | 151 0 | 9 | 3,530 | 4 3 | 151 0 | 4 |
| 2 | 3 | 2,940 | 3 9 | 115 0 | 9 | | | Weed out. | |
| 3 | 9 | 4,165 | 4 2 | 176 5 | 9 | 4,165 | 4 2 | 176 5 | 9 |
| 4 | 3 | 2,880 | 4 3 | 123 3 | 9 | | | Weed out. | |
| 5 | 14 | 3,519 | 4 0 | 141 6 | 9 | 3,519 | 4 0 | 141 6 | 14 |
| 6 | 4 | 3,226 | 4 3 | 144 9 | 9 | | | Weed out. | |
| 7 | 4 | 2,632 | 4 6 | 122 9 | 9 | | | Weed out. | |
| 8 | 6 | 3,838 | 4 2 | 161 9 | 9 | 3,838 | 4 2 | 161 9 | 6 |
| 9 | 7 | 3,376 | 4 2 | 142 7 | 9 | | | Weed out. | |
| 10 | 5 | 2,056 | 4 7 | 96 8 | 9 | | | Weed out. | |
| 11 | 8 | 3,758 | 4 2 | 157 3 | 9 | 3,758 | 4 2 | 157 3 | 8 |
| 12 | 7 | 3,200 | 4 5 | 144 7 | 9 | | | Weed out. | |
| Totals..... | | 39,120 | | 1,674 6 | | 18,810 | | 788 3 | |
| Averages..... | | 3,227 | 4 3 | 139 5 | | 3,762 | 4 2 | 157 6 | |

| Cows. | Total Yield of Milk. | Total Yield of Fat. | Price per 100 lbs. | Total Value. |
|-------|----------------------|---------------------|--------------------|--------------|
| | Lbs. | Lbs. | \$ cts. | \$ cts. |
| 12 | 39,120 | 1,674 6 | 1 00 | 391 20 |
| | | Cost of feed, | 12 cows at 30 00 | 360 00 |
| | | | Total profit | 31 20 |

Average profit per cow..... \$2.60

But, retaining only the 5 best cows the statement is :—

| | | | | |
|---|--------|--------------|------------------|----------|
| 5 | 18,810 | 788 3 | \$1 00 | \$188 10 |
| | | Cost of feed | 5 cows at 30 00. | 150 00 |
| | | | Total profit. | 38 10 |

Average profit per cow \$7 62

Besides the increased profit per cow there is a saving of work, and a saving of feed to the value of \$210.

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TABLE LXXXIII.—Showing the effect of Weeding Out the Cows giving Less than 3,000 pounds of milk for the Full Period of Lactation.

| 7 Cows. | | | | | | | | | |
|--------------|--------|-------|-------|------|--------|-------|-----------|-------|--|
| | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | |
| Cow No. | Lbs. | | Lbs. | | Lbs. | | Lbs. | | |
| 1..... | 3,320 | ..... | 135·0 | 4 | 3,320 | ..... | 135·0 | 4 | |
| 2..... | 3,481 | ..... | 152·2 | 4 | 3,481 | ..... | 152·2 | 4 | |
| 3..... | 3,395 | ..... | 135·7 | 5 | 3,395 | ..... | 135·7 | 5 | |
| 4..... | 2,942 | ..... | 121·1 | 6 | ..... | ..... | Weed out. | | |
| 5..... | 2,798 | ..... | 111·0 | 8 | ..... | ..... | Weed out. | | |
| 6..... | 3,649 | ..... | 144·2 | 9 | 3,649 | ..... | 144·2 | 9 | |
| 7..... | 3,225 | ..... | 134·3 | 13 | 3,225 | ..... | 134·3 | 13 | |
| Totals..... | 22,810 | ..... | 933·5 | ... | 17,070 | ..... | 701·4 | ..... |  |
| Average..... | 3,258 | 4·0 | 133·3 | 7 | 3,414 | 4·1 | 140·3 | 7 | |

| | | | | Total Yield of Milk. | Price per 100 lb. | Total Value. |
|------------------------------|--|--|--|-------------------------|----------------------|-----------------|
| | | | | Lbs. | \$ cts. | \$ cts. |
| 7 cows..... | | | | 22,810 | 1 00 | 228 10 |
| Cost of feed, \$28 each..... | | | | | | 196 00 |
| Total profit..... | | | | | | 32 10 |
| Average profit per cow..... | | | | | | 4 58 |

Now, by weeding out the two poorest cows the result is :—

| | | | | Total Yield of Milk. | Price per 100 lb. | Total Value. |
|------------------------------|--|--|--|-------------------------|----------------------|-----------------|
| | | | | Lbs. | \$ cts. | \$ cts. |
| 5 cows..... | | | | 17,070 | 1 00 | 170 70 |
| Cost of feed, \$28 each..... | | | | | | 140 00 |
| Total profit..... | | | | | | 30 70 |
| Average profit per cow..... | | | | | | 6 14 |

And a saving of feed to the value of \$56. The feed is stated by the owner to be, pasture, \$6; hay, \$15; straw, \$3; grain, \$3; roots, \$1, total, \$28.

Loss per cow can be converted into profit per cow by the culling process as instanced in the following table relative to a herd at St. Armand, Que.

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TABLE LXXXIV.—Weeding Out Cows giving Less than 4,000 lbs. milk.

| 17 Cows. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. |
|---------------|--------|-------|---------|-------|--------|-------|-----------|-------|
| Cow No. | Lbs. | | Lbs. | | Lbs. | | Lbs. | |
| 1..... | 3,580 | ..... | 153·6 | 7 | ..... | ..... | Weed out. | ..... |
| 2..... | 3,987 | ..... | 190·2 | 7 | ..... | ..... | Weed out. | ..... |
| 3..... | 3,359 | ..... | 129·0 | 7 | ..... | ..... | Weed out. | ..... |
| 4..... | 4,395 | ..... | 154·7 | 7 | 4,395 | ..... | 154·7 | 7 |
| 5..... | 4,228 | ..... | 184·8 | 9 | 4,228 | ..... | 184·8 | 9 |
| 6..... | 4,019 | ..... | 170·9 | 3 | 4,019 | ..... | 170·9 | 3 |
| 7..... | 4,517 | ..... | 187·4 | 2 | 4,517 | ..... | 187·4 | 2 |
| 8..... | 5,670 | ..... | 213·4 | 9 | 5,670 | ..... | 213·4 | 9 |
| 9..... | 5,065 | ..... | 211·9 | 9 | 5,065 | ..... | 211·9 | 9 |
| 10..... | 4,420 | ..... | 188·1 | 5 | 4,420 | ..... | 188·1 | 5 |
| 11..... | 3,052 | ..... | 111·5 | 10 | ..... | ..... | Weed out. | ..... |
| 12..... | 7,200 | ..... | 274·5 | 7 | 7,200 | ..... | 274·5 | 7 |
| 13..... | 3,555 | ..... | 225·5 | 14 | ..... | ..... | Weed out. | ..... |
| 14..... | 5,109 | ..... | 189·9 | 10 | 5,109 | ..... | 189·9 | 10 |
| 15..... | 4,568 | ..... | 186·4 | 4 | 4,568 | ..... | 186·4 | 4 |
| 16..... | 4,576 | ..... | 196·8 | 4 | 4,576 | ..... | 196·8 | 4 |
| 17..... | 3,167 | ..... | 148·0 | 5 | ..... | ..... | Weed out. | ..... |
| Total..... | 74,467 | ..... | 3,116·6 | ..... | 53,767 | ..... | 2,158·8 | ..... |
| Averages..... | 4,381 | 4·2 | 183·3 | ..... | 4,888 | 4·0 | 196·2 | ..... |

| | | Total Yield of Milk. | Total Yield of Fat. | Price per 100 lb. Milk. | Total Value. |
|---------|-------------------------|-------------------------|------------------------|----------------------------|-----------------|
| | | Lbs. | Lbs. | \$ cts. | \$ cts. |
| 17 cows | | 74,467 | 3,116·6 | 1 00 | 744 67 |
| | Cost of feed, \$16 each | | | | 782 00 |
| | Total loss | | | | 37 33 |
| | Average loss per cow. | | | | 2 20 |

But by weeding out 6 cows :

| | | Total Yield of Milk. | Total Yield of Fat. | Price per 100 lb. milk. | Total Value. |
|---------|---------------------|-------------------------|------------------------|----------------------------|-----------------|
| | | Lbs. | Lbs. | \$ cts. | \$ cts. |
| 11 cows | | 53,767 | 2,158·8 | 1 00 | 537 67 |
| | Cost of feed, \$16. | | | | 506 00 |
| | Total profit. | | | | 31 67 |
| | Average profit. | | | | 2 88 |

There is also a saving in labour, and in feed of \$276.

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TABLE LXXXV.—Weeding Out Ten Cows in a Quebec herd giving Less than 4,500 pounds of milk. Cost of Feed is given by the owner of this herd.

| 17 Cows. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. |
|------------------|--------|-------|---------|------|--------|-------|-----------|-------|
| Cow No. | Lbs. | | Lbs. | | Lbs. | | Lbs. | |
| 1..... | 3,580 | ..... | 153·6 | 7 | ..... | ..... | Weed out. | |
| 2..... | 3,987 | ..... | 190·2 | 7 | ..... | ..... | Weed out. | |
| 3..... | 4,395 | ..... | 154·7 | 7 | ..... | ..... | Weed out. | |
| 4..... | 4,228 | ..... | 184·8 | 9 | ..... | ..... | Weed out. | |
| 5..... | 4,019 | ..... | 170·9 | 3 | ..... | ..... | Weed out. | |
| 6..... | 4,517 | ..... | 187·4 | 2 | 4,517 | ..... | 187·4 | 2 |
| 7..... | 5,670 | ..... | 213·4 | 9 | 5,670 | ..... | 213·4 | 9 |
| 8..... | 5,065 | ..... | 211·9 | 9 | 5,065 | ..... | 211·9 | 9 |
| 9..... | 4,420 | ..... | 188·1 | 5 | ..... | ..... | Weed out. | |
| 10..... | 3,052 | ..... | 111·5 | 10 | ..... | ..... | Weed out. | |
| 11..... | 7,200 | ..... | 274·5 | 7 | 7,200 | ..... | 274·5 | 7 |
| 12..... | 3,555 | ..... | 225·5 | 14 | ..... | ..... | Weed out. | |
| 13..... | 5,109 | ..... | 189·9 | 10 | 5,109 | ..... | 189·9 | 10 |
| 14..... | 4,568 | ..... | 186·4 | 4 | 4,568 | ..... | 186·4 | 4 |
| 15..... | 4,576 | ..... | 196·8 | 4 | 4,576 | ..... | 196·8 | 4 |
| 16..... | 3,167 | ..... | 148·0 | 5 | ..... | ..... | Weed out. | |
| 17..... | 3,359 | ..... | 129·0 | 7 | ..... | ..... | Weed out. | |
| Totals | 74,467 | ..... | 3,116·6 | .. | 36,705 | ..... | 1,460·3 | ..... |
| Average..... | 4,381 | 4·2 | 183·3 | | 5,243 | 4·0 | 208·6 | |

| Cows. | Milk. | Fat. | Price. | Total. |
|------------------------------------|--------|---------|--------|----------|
| 17 | 74,467 | 3,116·6 | \$1.00 | \$744.67 |
| Cost of feed, 17 cows at \$46..... | | | | 782.00 |

Loss..... \$ 37.33, or \$2.20 each.

But, by weeding out 10 cows:—

| Cows. | Milk. | Fat. | Price. | Total. |
|-----------------------------------|--------|---------|--------|----------|
| 7 | 36,705 | 1,460·3 | \$1.00 | \$367.05 |
| Cost of feed, 7 cows at \$46..... | | | | 322.00 |

Profit..... \$ 45.05, or \$6.43 each.

Besides a saving in feed of \$460.

The average yield of this herd of seventeen cows stands at 4,381 pounds of milk and 183.3 pounds of fat. As the owner states, the average cost of feed was \$46 per cow. This table is prepared to show (1) that there is every indication of a loss of \$2.20 on each cow, but (2) that this loss could be turned into a profit of \$6.43 on each of seven cows if those giving less than 4,500 pounds of milk were disposed of.

Even allowing 25 cents per pound for butter fat, a loss per cow is indicated, which by weeding out the same cows could be turned into a profit of \$7.

In the following table relative to a herd at St. Armand, Que., is seen the result of having weeded out those cows giving less than 4,000 pounds of milk.

Although there are three 2-year olds included, and although the feed is estimated by the owner at \$45 per cow, there is a profit on each cow.

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TABLE LXXXVI.

| Cow Number | Pounds of Milk. | Test. | Pounds of Fat. | Age. |
|---------------|-----------------|-------|----------------|-------|
| 1. | 5,210 | | 216.8 | 2 |
| 2. | 5,575 | | 187.3 | 4 |
| 3. | 5,925 | ..... | 225.8 | 3 |
| 4. | 4,730 | ..... | 181.1 | 2 |
| 5. | 4,790 | ..... | 177.4 | 2 |
| 6. | 5,410 | ..... | 201.1 | 4 |
| 7. | 7,820 | ..... | 292.0 | 4 |
| 8. | 5,585 | ..... | 221.5 | 5 |
| 9. | 6,490 | ..... | 257.7 | ..... |
| Totals..... | 51,535 | ..... | 1,960.7 | ..... |
| Averages..... | 5,926 | 3.7 | 217.8 | ..... |

| Number of Cows. | Total Yield of Milk, lbs. | Total Yield of Fat, lbs. | Price per 100 lbs. Milk. | Value. |
|-----------------|---------------------------|--------------------------|--------------------------|------------------------------|
| 9 | 51,535 | 1,960.7 | \$1 00 | \$515 35 |
| | Cost of feed at \$45..... | | | 405 00 |
| Profit | | | | \$110 35 or \$12.26 each cow |

TABLE LXXXVII.—Showing the increased Profit, the saving in Labour, and the saving in Feed by weeding out the six poorest in a herd of eleven cows.

| Cow Number | Milk. | Fat. | Age. | Milk. | Fat. | Age. |
|--------------|--------|---------|-------|--------|-----------|-------|
| | Lbs. | Lbs. | | Lbs. | Lbs. | |
| 1. | 3,764 | 156.0 | 10 | 3,764 | 156.0 | 10 |
| 2. | 3,155 | 144.0 | 8 | ..... | Weed out. | ..... |
| 3. | 3,795 | 157.2 | 5 | 3,795 | 157.2 | 5 |
| 4. | 2,960 | 128.2 | 6 | ..... | Weed out. | ..... |
| 5. | 2,896 | 121.1 | 10 | ..... | Weed out. | ..... |
| 6. | 2,709 | 116.4 | 3 | ..... | Weed out. | ..... |
| 7. | 2,965 | 126.3 | 5 | ..... | Weed out. | ..... |
| 8. | 3,757 | 156.3 | 6 | 3,757 | 156.3 | 6 |
| 9. | 3,668 | 154.5 | 6 | 3,668 | 154.5 | 6 |
| 10. | 3,515 | 145.7 | 10 | 3,515 | 145.7 | 10 |
| 11. | 3,225 | 135.9 | 3 | ..... | Weed out. | ..... |
| Total ... | 36,409 | 1,541.6 | ..... | 18,499 | 769.7 | ..... |
| Average..... | 3,310 | 140.1 | ..... | 3,700 | 153.9 | ..... |

| | |
|---|----------|
| 11 cows, 36,409 lbs. milk at \$1.00 per 100 lbs..... | \$364 09 |
| Cost of feed, \$30..... | 330 00 |
| Total profit..... | \$ 34 09 |
| Average profit per cow..... | 3 10 |
| But :—5 cows, 18,499 lbs. milk at \$1.00 per 100 lbs..... | 184 99 |
| Cost of feed, \$30..... | 150 00 |
| Total profit..... | \$ 34 99 |
| Average profit per cow..... | 7 00 |

By keeping only five cows there would have been more profit than with all the eleven cows, a huge saving in labour, and \$180 worth of feed which might have been profitably used in further development of the five cows.

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TABLE LXXXVIII.—Effect of Weeding two cows out of three in a Prince Edward Island herd.

| Cow Number | Pounds of Milk. | Pounds of Fat. | Pounds of Milk. | Pounds of Fat. |
|---------------|-----------------|----------------|-----------------|----------------|
| 1..... | 5,142 | 192·2 | 5,142 | 192·2 |
| 2..... | 3,840 | 131·1 | ..... | Weed out. |
| 3..... | 3,070 | 100·1 | ..... | Weed out. |
| Totals..... | 12,052 | 426·4 | 5,142 | 192·2 |
| Averages..... | 4,017 | 142·1 | 5,142 | 192·2 |

The three cows in this herd have an average yield of 4,017 pounds of milk and 142·1 pounds of fat. Cow No. 1 gives 1,125 pounds of milk and 50 pounds of fat, equal to 58 pounds of butter more than the average of the three cows.

All the three cows give a total yield of 12,052 pounds of milk, which, valued at \$1 per 100 pounds, means an income of \$120.52; with a cost of \$40 each for feed, the profit is only 52 cents on the three cows for the year; an average, forsooth, of 17 cents profit on each of the three cows.

Cow No. 1, on the same basis, made \$11.42 profit, or sixty-seven times as much. In addition, there would be \$80 worth of feed on hand.

TABLE LXXXIX.—Effect of Weeding Out the five poorest cows in a herd of 23 in an Association in Dundas County, Ontario.

| Cow Number | Pounds of Milk. | Pounds of Fat. | Pounds of Milk. | Pounds of Fat. |
|---------------|-----------------|----------------|-----------------|----------------|
| 1..... | 5,770 | 197·3 | 5,770 | 197·3 |
| 2..... | 5,330 | 180·6 | 5,330 | 180·6 |
| 3..... | 5,680 | 211·0 | 5,650 | 211·0 |
| 4..... | 5,350 | 198·9 | 5,350 | 198·9 |
| 5..... | 3,730 | 137·2 | ..... | Weed out. |
| 6..... | 5,330 | 185·4 | 5,330 | 185·4 |
| 7..... | 5,200 | 195·9 | 5,200 | 195·9 |
| 8..... | 4,640 | 170·9 | 4,640 | 170·9 |
| 9..... | 4,820 | 171·8 | 4,820 | 171·8 |
| 10..... | 5,008 | 188·6 | 5,008 | 188·6 |
| 11..... | 4,900 | 172·6 | 4,900 | 172·6 |
| 12..... | 4,535 | 164·2 | 4,535 | 164·2 |
| 13..... | 4,655 | 164·4 | 4,655 | 164·4 |
| 14..... | 4,270 | 155·9 | 4,270 | 155·9 |
| 15..... | 4,630 | 167·2 | 4,630 | 167·2 |
| 16..... | 5,420 | 193·4 | 5,420 | 193·4 |
| 17..... | 4,858 | 169·4 | 4,858 | 169·4 |
| 18..... | 4,841 | 172·8 | 4,841 | 172·8 |
| 19..... | 3,210 | 117·5 | ..... | Weed out. |
| 20..... | 3,330 | 122·0 | ..... | Weed out. |
| 21..... | 2,856 | 106·5 | ..... | Weed out. |
| 22..... | 4,070 | 152·4 | 4,070 | 152·4 |
| 23..... | 2,216 | 81·5 | ..... | Weed out. |
| Totals..... | 104,649 | 3,777·4 | 89,307 | 3,212·7 |
| Averages..... | 4,550 | 164·2 | 4,961 | 178·5 |

Increase in average of milk, 411 pounds per cow.
Increase in average of fat, 14·3 pounds per cow.
Equivalent to 17 pounds of butter per annum.

In the above herd of 23 cows, the average yield is seen to be 4,550 pounds of milk and 164·2 pounds of fat. By weeding out the five poorest cows there would be a sav-

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ing of labour attendant on keeping five cows for one year, a saving of \$200 worth of feed, and an increase in the average herd yield by 17 pounds of butter per annum.

The profit per cow would be increased from \$5.50 per cow to \$9.61 per cow according to the following statement.

| Number of Cows. | Total Yield of Milk, lbs. | Total Yield of Fat, lbs. | Price per 100 lbs. Milk | Total Value. |
|-----------------|------------------------------|--------------------------|-------------------------|--------------------------|
| 23 | 104,649 | 3,777.4 | \$1.00 | \$1,046.49 |
| | Cost of feed, \$40 each..... | | | 920.00 |
| | Total profit..... | | | \$126.49 or \$5.50 each. |
| 18 | 89,307 | 3,212.7 | \$1.00 | \$893.07 |
| | Cost of feed, \$40 each..... | | | 720.00 |
| | Total profit..... | | | \$173.07 or \$9.61 each. |

TABLE XC.—Effect of Weeding the four poorest cows in a Herd of Eight in a British Columbia Association.

| Cow Number. | Pounds of Milk. | Pounds of Fat. | Pounds of Milk. | Pounds of Fat. |
|---------------|-----------------|----------------|-----------------|----------------|
| 1..... | 7,035 | 301.3 | 7,035 | 301.3 |
| 2..... | 6,325 | 305.0 | 6,325 | 305.0 |
| 3..... | 5,680 | 230.5 | 5,680 | 230.5 |
| 4..... | 6,505 | 230.9 | 6,505 | 230.9 |
| 5..... | 3,910 | 186.2 | ..... | Weed out. |
| 6..... | 4,025 | 182.8 | ..... | Weed out. |
| 7..... | 3,385 | 152.7 | ..... | Weed out. |
| 8..... | 3,560 | 171.1 | ..... | Weed out. |
| Totals..... | 40,425 | 1,760.5 | 25,545 | 1,067.7 |
| Averages..... | 5,053 | 220.0 | 6,386 | 267.0 |

By weeding out four cows from this herd of eight the average yield would be increased by 1,333 pounds of milk and 66 pounds of butter per cow.

The average profit would also be raised from \$5.53 to \$18.83 per cow as shown below.

| Number of Cows. | Total Yield of Milk, lbs. | Total Yield of Fat, lbs. | Price per 100 lbs. Milk. | Total Value. |
|-----------------|---------------------------|--------------------------|--------------------------|------------------------------|
| 8 | 40,425 | 1,760.5 | \$1.00 | \$404.25 |
| | Cost of feed at \$45..... | | | 360.00 |
| | Total profit..... | | | \$ 44.25 or \$5.53 each cow. |

But with 4 good cows :—

| | | | | |
|---|---------------------------|---------|--------|-------------------------------|
| 4 | 25,545 | 1,067.7 | \$1.00 | \$255.45 |
| | Cost of feed at \$45..... | | | 180.00 |
| | Total profit..... | | | \$ 75.45 or \$18.83 each cow. |

Thus one could keep four cows instead of eight, saving half the labour and make \$31.20 more profit, and over three times as much profit per cow.

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TABLE XCI.—Total and Average Yield of 72 Cows tested Seven Months, 1908.

| Associations. | Number of Cows. | Total yield of Milk. | Total yield of Fat. | Average yield of Milk. | Average Test. | Average yield of Fat. |
|--------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Chilliwack. | 2 | 9,248 | 322·1 | 4,624 | 3·5 | 161·0 |
| Comox. | 14 | 52,946 | 2,199·1 | 3,782 | 4·1 | 157·0 |
| Cowichan ... | 30 | 113,177 | 4,980·9 | 3,772 | 4·4 | 166·0 |
| Eden Bank..... | 23 | 114,285 | 4,314·3 | 4,969 | 3·7 | 187·6 |
| Nanaimo..... | 3 | 13,655 | 572·0 | 4,551 | 4·2 | 190·6 |
| Totals and averages..... | 72 | 303,311 | 123,884·0 | 4,215 | 4·0 | 172·0 |

TABLE XCII.—Total and Average Yield of 63 Cows tested Eight Months, 1908.

| Associations. | Number of Cows. | Total yield of Milk. | Total yield of Fat. | Average yield of Milk. | Average Test. | Average yield of Fat. |
|--------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Chilliwack. | 10 | 47,004 | 1,569·9 | 4,700 | 3·3 | 156·9 |
| Comox..... | 19 | 82,310 | 3,429·0 | 4,332 | 4·1 | 180·4 |
| Cowichan | 19 | 74,638 | 3,231·7 | 3,928 | 4·3 | 170·1 |
| Eden Bank..... | 15 | 77,253 | 2,948·8 | 5,150 | 3·8 | 196·5 |
| Totals and averages..... | 63 | 281,205 | 11,179·4 | 4,463 | 4·0 | 177·4 |

TABLE XCIII.—Total and Average Yield of 39 Cows tested Nine Months, 1908.

| Associations. | Number of Cows. | Total yield of Milk. | Total yield of Fat. | Average yield of Milk. | Average Test. | Average yield of Fat. |
|--------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Comox. | 9 | 38,776 | 1,694·8 | 4,308 | 4·3 | 188·3 |
| Cowichan | 17 | 75,247 | 3,254·2 | 4,426 | 4·3 | 191·4 |
| Eden Bank..... | 9 | 57,411 | 2,023·7 | 6,379 | 3·5 | 224·8 |
| Nanaimo. | 4 | 25,812 | 1,091·1 | 6,453 | 4·2 | 272·8 |
| Totals and averages..... | 39 | 197,246 | 8,063·8 | 5,057 | 4·1 | 206·7 |

TABLE XCIV.—Total and Average Yield of 24 Cows tested Ten Months, 1908.

| Associations. | Number of Cows. | Total yield of Milk. | Total yield of Fat. | Average yield of Milk. | Average Test. | Average yield of Fat. |
|--------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Chilliwack. | 4 | 24,995 | 800·9 | 6,249 | 3·2 | 200·2 |
| Comox..... | 4 | 23,405 | 1,091·5 | 5,851 | 4·6 | 272·9 |
| Cowichan | 2 | 18,984 | 643·1 | 9,492 | 3·4 | 321·5 |
| Eden Bank..... | 7 | 46,749 | 1,814·1 | 6,678 | 3·8 | 259·1 |
| Nanaimo | 4 | 23,705 | 1,083·5 | 5,926 | 4·5 | 270·8 |
| Richmond..... | 3 | 22,830 | 709·2 | 7,610 | 3·1 | 236·4 |
| Totals and averages..... | 24 | 160,668 | 6,142·3 | 6,694 | 3·8 | 255·9 |

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TABLE XCV.—Total and Average Yield of 15 Cows tested Eleven Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Cowichan | 7 | 44,156 | 1,846·6 | 6,308 | 4·2 | 263·8 |
| Eden Bank.. | 5 | 31,475 | 1,382·1 | 6,295 | 4·4 | 276·4 |
| Nanaimo..... | 3 | 21,000 | 978·8 | 7,000 | 4·6 | 326·2 |
| Totals and averages..... | 15 | 96,631 | 4,207·5 | 6,442 | 4·4 | 280·5 |

TABLE XCVI.—Total and Average Yield of 54 Cows tested Twelve Months, 1908.

| Associations. | Number of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------------------|-----------------------|----------------------------|---------------------------|------------------------------|------------------|-----------------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Chilliwack | 6 | 41,877 | 1,766·3 | 6,979 | 4·2 | 294·4 |
| Comox. | 10 | 65,935 | 2,785·7 | 6,593 | 4·2 | 278·5 |
| Cowichan | 18 | 112,636 | 5,086·5 | 6,257 | 4·5 | 282·5 |
| Eden Bank..... | 8 | 57,282 | 2,404·1 | 7,160 | 4·2 | 300·5 |
| Nanaimo. | 5 | 35,733 | 1,763·2 | 7,146 | 4·9 | 332·6 |
| Richmond... .. | 7 | 66,970 | 2,185·3 | 9,567 | 3·2 | 312·1 |
| Totals and averages..... | 54 | 380,433 | 15,991·1 | 7,045 | 4·2 | 296·1 |

In this series of comparisons of total and average yields for periods of from seven to twelve months, it will be noticed that there is a marked difference between the average yield of milk per herd in the several associations and the general average yield of all the associations as given in the bottom line at the foot of each table. In the comparisons for ten months, for instance, the four cows in the Comox Association, producing only 23,405 pounds of milk, average 843 pounds less than the 6,694 pounds average of all the twenty-four cows; and vice versa, the two cows at Cowichan are 2,798 pounds of milk above that general average.

Some noteworthy contrasts appear in the British Columbia associations between cows calving just about the same time.

| | | |
|------------------------------|-----------------|--------------|
| Cow milking 9 months, age 8, | 6,115 lb. milk, | 233 lb. fat. |
| " 9 " " 10, | 2,980 | " 159 " |
| " 11 " " 6, | 10,068 | " 448 " |
| " 11 " " 8, | 5,915 | " 220 " |
| Full period lactation, | " 5, 9,895 | " 257 " |
| " " " 11, | 3,553 | " 165 " |
| " " " 2, | 7,045 | " 222 " |
| " " " 8, | 5,563 | " 174 " |

Such differences in yields, running as high as 6,342 pounds of milk, and 228 pounds of fat, again emphasize the need for considering each cow in the herd on her own particular merits.

CHILLIWACK B.C., ASSOCIATION.

TABLE XCVII.—Comparisons between herds for Full Period of Lactation in 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 15 | 6,430 | 3·2 | 203·7 | 6 | 9,825 | 3·1 | 303·9 | 2 | 4,770 | 3·3 | 157·0 |
| B | 5 | 5,979 | 3·8 | 230·0 | 8 | 6,825 | 4·1 | 280·3 | 3 | 4,417 | 4·2 | 186·7 |
| C | 5 | 7,665 | 4·4 | 335·8 | 7 | 8,864 | 4·6 | 408·1 | 4 | 5,885 | 4·1 | 240·0 |

If butter fat is valued at 30 cents per pound, the best cow in herd C has an earning power over the poorest cow in the same herd of more than fifty dollars. Who can wish to remain content with a knowledge of the total production of a herd, or average yields, when such differences exist between individual cows in the same herd under the same management?

COMOX, B.C., ASSOGIATION.

TABLE XCVIII.—Comparisons between herds for Full Period of Lactation, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 10 | 4,542 | 4·5 | 206·6 | 7 | 5,665 | 4·7 | 267·1 | 4 | 3,605 | 5·1 | 187·0 |
| B | 14 | 5,755 | 3·9 | 225·4 | 5 | 7,270 | 3·9 | 281·5 | 5 | 4,620 | 4·0 | 185·0 |
| C | 6 | 4,311 | 4·3 | 185·2 | 6 | 5,189 | 4·3 | 224·4 | 5 | 3,810 | 3·9 | 149·1 |
| D | 10 | 5,191 | 4·1 | 215·9 | 9 | 6,773 | 4·7 | 322·0 | 6 | 3,615 | 4·7 | 172·5 |
| E | 8 | 6,864 | 1·4 | 303·0 | 4 | 7,235 | 4·9 | 355·3 | 8 | 5,576 | 3·9 | 217·4 |
| F | 5 | 5,030 | 5·3 | 267·6 | 2 | 5,870 | 4·8 | 281·4 | 2 | 4,327 | 5·2 | 224·6 |
| G | 17 | 4,280 | 4·3 | 184·9 | 6 | 5,625 | 4·4 | 242·0 | 2 | 2,510 | 5·4 | 137·2 |

In herd D the best yield is 1,582 pounds of milk above the average of the ten cows in the herd, and the poorest yield is practically the same, 1,576 pounds below the average. The high test, however, of this 6-year old influences the comparison of yield of fat, for she is only 43·4 pounds of fat below the herd average, though the 9-year old is 106 pounds of fat above.

The poorest cows in herds F and G are again indicative of the individuality of heifers.

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COMOX, B.C., ASSOCIATION.

TABLE XCIX.—Comparisons between herds for Eight Months, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 4 | 5,242 | 3.7 | 194.9 | 4 | 6,860 | 3.3 | 226.9 | 2 | 4,140 | 3.6 | 149.7 |
| B | 5 | 3,523 | 4.2 | 148.2 | — | 4,665 | 3.6 | 168.5 | — | 2,640 | 3.8 | 101.4 |
| C | 4 | 5,032 | 4.2 | 212.5 | 7 | 6,515 | 3.8 | 248.0 | 2 | 2,490 | 4.5 | 111.9 |

With the poorest cows in herds B and C giving within eleven pounds of fat of one another, it is surprising to see the one herd averaging 64 pounds of fat more than the other. If the best cow in herd B were anywhere near the other two good cows in herds A and C in production of either milk or fat, the herd average of the five cows might be nearer a 5,000 pound level.

COWICHAN, B.C., ASSOCIATION

TABLE C.—Comparisons between 16 herds for Full Period of Lactation, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 41 | 6,138 | 4.0 | 243.7 | 5 | 9,895 | 2.6 | 257.1 | 4 | 3,170 | 5.5 | 174.4 |
| B | 8 | 6,341 | 4.8 | 303.0 | 3 | 8,056 | 4.5 | 366.1 | 2 | 3,770 | 4.6 | 175.3 |
| C | 9 | 6,604 | 4.5 | 300.8 | 8 | 8,985 | 3.7 | 376.4 | 2 | 4,569 | 4.2 | 192.1 |
| D | 4 | 6,585 | 4.2 | 274.4 | 4 | 7,150 | 4.2 | 300.9 | 5 | 6,110 | 4.7 | 289.4 |
| E | 7 | 6,665 | 3.8 | 256.1 | 7 | 7,211 | 4.0 | 285.0 | 11 | 6,100 | 3.8 | 230.2 |
| F | 10 | 5,760 | 4.5 | 259.5 | 5 | 8,610 | 5.4 | 434.2 | 2 | 3,790 | 5.0 | 185.7 |
| G | 11 | 4,861 | 4.6 | 226.8 | 7 | 6,213 | 4.6 | 285.9 | 7 | 4,351 | 4.3 | 189.1 |
| H | 6 | 6,755 | 4.7 | 321.7 | 5 | 7,520 | 4.7 | 352.0 | 2 | 5,845 | 4.2 | 245.2 |
| I | 10 | 5,866 | 4.3 | 252.2 | 9 | 7,370 | 4.6 | 343.5 | 8 | 4,070 | 6.3 | 259.1 |
| J | 6 | 3,987 | 4.4 | 175.0 | 7 | 4,670 | 4.0 | 184.3 | 3 | 3,106 | 5.0 | 155.8 |
| K | 5 | 4,354 | 4.0 | 171.5 | 6 | 5,680 | 4.2 | 237.5 | 2 | 2,520 | 3.9 | 98.3 |
| L | 6 | 7,720 | 4.7 | 363.3 | 6 | 9,880 | 4.0 | 393.7 | 5 | 5,890 | 5.0 | 292.1 |
| M | 5 | 4,512 | 3.7 | 170.5 | 5 | 5,785 | 3.7 | 211.8 | 3 | 3,646 | 3.8 | 139.5 |
| N | 6 | 5,782 | 4.1 | 235.9 | 8 | 7,200 | 4.0 | 282.5 | 5 | 5,255 | 4.0 | 208.7 |
| O | 8 | 3,857 | 4.3 | 167.1 | 7 | 5,177 | 4.4 | 228.8 | 7 | 2,875 | 4.4 | 127.3 |
| P | 4 | 4,871 | 4.1 | 201.9 | 2 | 5,035 | 4.3 | 218.1 | 2 | 4,750 | 3.8 | 182.9 |

Such comparisons as are only made possible by a table of this nature should make every owner of dairy cows redouble his energetic inquiries into the possibilities lurking undiscovered under his stable roof. Higher yields are possible.

While there are six 2-year olds that are responsible for the lowest yields in the sixteen herds, still a reference to table 107, devoted to the yields of 2-year-old heifers, should make it clear that only one extra low yield, herd K, has much effect on these comparisons. The other heifers give fairly good yields.

Again are to be seen cows of seven, eight and eleven years of age that ought to be ashamed of themselves, or that ought to cause their owners some heart burnings, for appearing in the list of poorest cows.

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As in herd A is found one of the best yields, so also in the same herd it noticed one of the sharpest contrasts between best and poorest cow.

The sixteen best cows average 7,152 pounds of milk and 295 pounds of fat; and the sixteen poorest cows average 2,789 pounds of milk and 98 pounds of fat less than the best cows. If butter fat is worth 30 cents per pound, this means an average difference of over twenty-nine dollars in the earnings of two cows in each herd for the season. Does not this indicate loss?

EDEN BANK, B.C., ASSOCIATION.

TABLE CI.—Comparisons between herds for Seven Months, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 5 | 4,627 | 4·0 | 186·0 | 5 | 5,295 | 4·3 | 227·7 | 4 | 3,600 | 3·7 | 132·9 |
| B | 4 | 6,307 | 3·5 | 219·9 | 2½ | 7,280 | 3·5 | 259·2 | ..... | 5,030 | 3·5 | 175·9 |
| C | 6 | 4,445 | 3·9 | 175·2 | ..... | 6,130 | 3·9 | 239·0 | ..... | 2,800 | 5·1 | 143·5 |

In herd C the cow giving the poorest yield has a particularly high average test, noticeably above the average test of the herd.

The 2-year old in the eight months list following is also conspicuously high in the test

TABLE CII.—Comparisons between herds for Eight Months, 1908.

| Herd | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|------|----------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 4 | 5,695 | 3·6 | 207·3 | 13 | 6,670 | 3·6 | 241·0 | 14 | 4,120 | 4·0 | 167·8 |
| B | 7 | 4,324 | 4·1 | 179·7 | 6 | 5,750 | 3·5 | 202·9 | 2 | 3,330 | 4·6 | 155·1 |

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TABLE CIII.—Comparisons between herds for Full Period of Lactation, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------|---------------|-------|-------|--------------------|--------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 4 | 7,027 | 3.4 | 240.5 | 10 | 9,063 | 3.1 | 288.5 | 4 | 5,100 | 3.2 | 166.2 |
| B | 5 | 6,601 | 4.1 | 272.5 | 8 | 7,690 | 4.5 | 348.6 | 6 | 6,030 | 3.6 | 217.7 |
| C | 8 | 5,066 | 3.6 | 185.6 | 8 | 6,580 | 3.7 | 246.2 | 2 | 4,440 | 3.3 | 148.2 |
| D | 28 | 6,782 | 4.0 | 271.9 | 11 | 10,030 | 3.5 | 357.7 | 6 | 4,940 | 4.0 | 199.7 |
| E | 22 | 6,934 | 3.5 | 245.1 | 7 | 9,773 | 3.7 | 364.1 | 2 | 2,835 | 3.3 | 95.0 |
| F | 4 | 4,886 | 3.8 | 187.2 | 4 | 5,665 | 3.4 | 197.8 | 9 | 4,240 | 4.3 | 184.8 |
| G | 8 | 5,053 | 4.3 | 220.0 | 8 | 7,035 | 4.2 | 301.3 | 2 | 3,385 | 4.5 | 152.7 |
| H | 7 | 5,683 | 3.4 | 197.5 | 10 | 8,012 | 3.2 | 257.8 | 8 | 3,267 | 4.0 | 130.9 |
| I | 8 | 4,949 | 3.7 | 191.7 | 4 | 5,890 | 3.6 | 211.2 | 3 | 3,430 | 4.0 | 138.8 |

One interesting feature of this table is the noteworthy averages made by the two large herds D and E. Herd D is mostly Ayrshire, with a little Jersey blood; herd E is almost entirely Shorthorn.

Herd B has an average of 86.9 pounds of fat more than that of herd C.

Four out of these nine herds have individual cows yielding over 300 pounds of fat, two giving over 350 pounds, which production is of a very different order from the six, eight and nine year old cows' low yields in the last column.

NANAIMO, B.C., ASSOCIATION.

TABLE CIV.—Comparisons between herds for Full Period of Lactation, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 6 | 4,683 | 4.5 | 214.3 | 3 | 5,635 | 4.6 | 260.6 | 2 | 4,420 | 4.0 | 176.2 |
| B | 6 | 5,093 | 5.0 | 256.2 | 5 | 6,800 | 3.9 | 268.7 | 8 | 3,685 | 5.8 | 215.7 |
| C | 4 | 7,275 | 4.2 | 307.8 | 6 | 8,975 | 4.3 | 384.9 | 3 | 4,995 | 4.8 | 240.5 |

If one is looking for variations in yields of milk between two individual cows in the same herd, an instance may be found in herd B where there is a difference between the best cow and the poorest cow of 3,115 pounds of milk.

In herd C the difference is 144 pounds of fat.

TABLE CV.—The Yields of 417 Individual Cows for Full Period of Lactation in 7, 8, 9, 10, 11 and 12 Months in British Columbia Associations are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | | | | | | Total Number of Cows. | Number of Herds Represented. | Number of Associations. |
|-------------------|--------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|------------------------------|-------------------------|
| | 2,000 to 3,000 lb. | 3,000 to 4,000 lb. | 4,000 to 5,000 lb. | 5,000 to 6,000 lb. | 6,000 to 7,000 lb. | 7,000 to 8,000 lb. | 8,000 to 9,000 lb. | 9,000 to 10,000 lb. | 10,000 to 11,000 lb. | 11,000 to 12,000 lb. | 12,000 to 13,000 lb. | 13,000 to 14,000 lb. | 14,000 to 15,000 lb. | | | |
| | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | | | |
| 7 | 1 | 3 | | | | | | | | | | | | 4 | 2 | 2 |
| 8 | 4 | 8 | 5 | 4 | 2 | | | | | | | | | 23 | 14 | 4 |
| 9 | 1 | 7 | 15 | 13 | 10 | 3 | 4 | 2 | 1 | | | | | 56 | 28 | 6 |
| 10 | | 10 | 27 | 37 | 24 | 16 | 7 | 4 | 2 | | | 1 | | 131 | 44 | 6 |
| 11 | | 9 | 25 | 37 | 30 | 23 | 15 | 8 | 1 | | | 1 | 2 | 152 | 46 | 6 |
| 12 | | 5 | 5 | 10 | 16 | 4 | 5 | 3 | 2 | | 1 | | | 51 | 25 | 5 |
| Number of Cows.. | 6 | 42 | 77 | 101 | 82 | 46 | 31 | 17 | 6 | 4 | 1 | 2 | 2 | 417 | ..... | ..... |

This table indicates the lengthy period of lactation, and the large proportion of cows giving over 5,000 lb. milk.

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TABLE CVI.—The yield of 267 Individual Cows for periods of 7, 8, 9, 10, 11 and 12 Months in British Columbia Associations are classified as follows :—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | | | | | Total Number of Cows. | Number of Herds Represented. | Number of Associations. |
|----------------------------|--------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|-----|-----------------------|------------------------------|-------------------------|
| | 1,000 to 2,000 Lbs. | 2,000 to 3,000 Lbs. | 3,000 to 4,000 Lbs. | 4,000 to 5,000 Lbs. | 5,000 to 6,000 Lbs. | 6,000 to 7,000 Lbs. | 7,000 to 8,000 Lbs. | 8,000 to 9,000 Lbs. | 9,000 to 10,000 Lbs. | 10,000 to 11,000 Lbs. | 11,000 to 12,000 Lbs. | | | | |
| | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | No. of Cows. | | | | |
| 7..... | 1 | 10 | 21 | 22 | 12 | 3 | 3 | ..... | ..... | ..... | ..... | 72 | 31 | 5 | |
| 8..... | ..... | 6 | 18 | 20 | 10 | 9 | ..... | ..... | ..... | ..... | ..... | 63 | 24 | 4 | |
| 9..... | ..... | 2 | 7 | 12 | 7 | 7 | 4 | ..... | ..... | ..... | ..... | 39 | 20 | 4 | |
| 10..... | ..... | ..... | ..... | 3 | 8 | 3 | 4 | 3 | 2 | 1 | ..... | 24 | 13 | 6 | |
| 11..... | ..... | ..... | 1 | 1 | 6 | 2 | 1 | 2 | 1 | 1 | ..... | 15 | 11 | 3 | |
| 12..... | ..... | ..... | ..... | 4 | 14 | 10 | 12 | 6 | 6 | 1 | 1 | 54 | 16 | 6 | |
| Total number of cows | 1 | 18 | 47 | 62 | 57 | 34 | 24 | 11 | 9 | 3 | 1 | 267 | ..... | ..... |  |

A striking feature of this table is the proportion of cows still milking after 10 and 11 months activity.

TABLE CVII.—The yields in Milk and Fat of 64 Individual two-year old Heifers for Full Period of Lactation in 1908, in the Province of British Columbia, are classified as follows :—

| Total Yield of Fat in Pounds. | TOTAL YIELD OF MILK IN POUNDS. | | | | | | | | Total Number of Heifers. | Number of Herds Represented. | Number of Associations. |
|-------------------------------|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------------|------------------------------|-------------------------|
| | | | | | | | | | | | |
| | 2,000 to 3,000 | 3,000 to 4,000 | 4,000 to 5,000 | 5,000 to 6,000 | 6,000 to 7,000 | 7,000 to 8,000 | 8,000 to 9,000 | 9,000 to 10,000 | | | |
| 75 to 100. | No. of Heifers. 2 | No. of Heifers. | No. of Heifers. | No. of Heifers. | No. of Heifers. | No. of Heifers. | No. of Heifers. | No. of Heifers. | 2 | 2 | 2 |
| 100 to 125. | 1 | 2 | | | | | | | 3 | 3 | 3 |
| 125 to 150. | | 3 | 1 | | | | | | 4 | 4 | 2 |
| 150 to 175. | 2 | 7 | 4 | 2 | | | | | 15 | 10 | 4 |
| 175 to 200. | | 7 | 7 | 3 | | | | | 17 | 12 | 5 |
| 200 to 225. | | 1 | 1 | 3 | 2 | | | | 7 | 7 | 4 |
| 225 to 250. | | 1 | 2 | 3 | 1 | 1 | 1 | | 9 | 8 | 4 |
| 250 to 275. | | | | | | 1 | 1 | 1 | 3 | 1 | 1 |
| 275 to 300. | | | | 2 | | | | 1 | 3 | 2 | 2 |
| 300 to 325. | | | | 1 | | | | | 1 | 1 | 1 |
| Total number of Heifers. | 5 | 21 | 15 | 14 | 3 | 2 | 2 | 2 | 64 | | |

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This table indicates that 21 out of the 64 of these heifers produced between 3,000 and 4,000 pounds of milk; 38 gave over 4,000 pounds of milk, and two gave over 9,000 pounds. As regards yield of fat, 17 gave between 175 and 200 pounds, and 23 out of the 64 gave over 225 pounds.

In one herd were three heifers all giving between 7,000 and 10,000 pounds of milk, and between 250 and 275 pounds of fat.

In another herd were two heifers with remarkably differing yields: one gave 5,060 pounds of milk and 199 pounds of fat; the other gave only 2,760 pounds of milk and 152 pounds of fat.

While there are several promising heifers included in this table, it should be remembered that a minimum of 4,500 pounds of milk or 200 pounds of fat is what a good heifer is expected to yield.

The length of the milking period averages 9.4 months for those giving less than 4,000 pounds of milk, and 10.1 months for those giving over 4,000 pounds of milk. This suggests the advisability of inducing at least a nine or ten months' period, so as to fix that habit of a long season of production both for succeeding years, as well as for succeeding generations.

TABLE CVIII.—Comparisons between Herds of Ten Cows and Over in the Province of British Columbia, for Full Period of Lactation in 1908.

| Name of Association. | Herd | No. of Cows. | TOTAL YIELD OF HERD. | | AVERAGE YIELD OF HERD. | | | Average milking period in Months. | Average Age of Herd. | YIELD OF BEST COW. | | | YIELD OF POOREST COW. | | | Age of Poorest Cow. |
|----------------------|------|--------------|----------------------|----------|------------------------|-------|-------|-----------------------------------|----------------------|--------------------|-------|-------|-----------------------|------|-------|---------------------|
| | | | Milk. | Fat. | Milk. | Test. | Fat. | | | Milk. | Test. | Fat. | | | | |
| | | | | | | | | | | | | | Lbs. | Lbs. | Lbs. | |
| Comox | A | 10 | 45,420 | 2066.0 | Lbs. | 4.5 | 206.6 | 10.1 | 5.7 | Lbs. | 4.7 | 267.1 | 3,605 | 5.1 | 187.0 | 4 |
| " | B | 11 | 80,570 | 3156.6 | Lbs. | 3.9 | 225.4 | 9.6 | 5.5 | Lbs. | 3.9 | 281.5 | 4,620 | 4.0 | 185.0 | 5 |
| " | D | 10 | 51,910 | 2159.0 | Lbs. | 4.1 | 215.9 | 10.5 | 6.7 | Lbs. | 4.7 | 322.0 | 3,615 | 4.7 | 172.5 | 6 |
| " | G | 17 | 72,760 | 3143.3 | Lbs. | 4.3 | 184.9 | 9.2 | 4.5 | Lbs. | 4.4 | 242.0 | 2,510 | 5.4 | 137.2 | 2 |
| Chilliwack | A | 15 | 96,458 | 3048.9 | Lbs. | 3.2 | 203.7 | 10.5 | 4.4 | Lbs. | 3.1 | 303.9 | 4,770 | 3.3 | 157.0 | 6 |
| Cowichan. | A | 41 | 251,647 | 9993.5 | Lbs. | 4.0 | 243.7 | 11.5 | 6.1 | Lbs. | 2.6 | 257.1 | 3,170 | 5.5 | 174.4 | 5 |
| " | F | 10 | 57,600 | 2595.2 | Lbs. | 4.5 | 259.5 | 10.3 | 3.7 | Lbs. | 5.4 | 434.2 | 3,790 | 5.0 | 185.7 | 5 |
| " | G | 11 | 53,470 | 2495.2 | Lbs. | 4.6 | 226.8 | 11.0 | 6.1 | Lbs. | 4.6 | 285.9 | 4,351 | 4.3 | 189.1 | 7 |
| " | I | 10 | 58,665 | 2522.8 | Lbs. | 4.3 | 252.2 | 10.7 | 6.7 | Lbs. | 4.6 | 343.5 | 4,070 | 6.3 | 259.1 | 9 |
| Eden Bank. | D | 24 | 189,896 | 7613.2 | Lbs. | 4.0 | 271.9 | 10.8 | 5.3 | Lbs. | 3.5 | 357.7 | 4,940 | 4.0 | 199.7 | 11 |
| " | E | 22 | 152,548 | 5392.2 | Lbs. | 3.5 | 245.1 | 9.4 | 5.3 | Lbs. | 3.7 | 364.1 | 2,835 | 3.3 | 95.0 | 7 |
| Richmond. | A | 30 | 302,309 | 9622.5 | Lbs. | 3.2 | 320.7 | 10.5 | 5.2 | Lbs. | 2.8 | 397.1 | 6,538 | 3.1 | 205.6 | 9 |
| Totals and Averages | | 218 | 1,413,253 | 53,808.4 | Lbs. | 3.6 | 246.8 | | | Lbs. | 3.8 | 321.6 | 4,067 | 4.4 | 178.9 | |

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Probably the most striking feature of this table, No. 108, is the satisfactory average of herd A in the Richmond association, where all the thirty cows average over 10,000 pounds of milk, 3.2 test and 320.7 pounds of fat.

The lowest average is 4,280 pounds of milk, 4.3 test, 184.9 pounds of fat, in a herd of seventeen cows.

The large herds have the large averages: this province is evidently the home of some good dairymen.

Eight out of the twelve herds average 4.0 per cent of fat or over.

The average age of all the cows in each herd varies from 3.7 to 6.7 years. The herd with the youngest average age makes a creditable showing.

The highest yield of milk is found to be 14,310 pounds, testing 2.8 per cent of fat; while the best cow in another herd gives only 5,625 pounds of milk, the test is up to 4.4 per cent of fat.

With regard to the poorest cow in each herd, one 2-year old is responsible for a yield of only 2,510 pounds of milk, though it tests 5.4 per cent of fat. A second 2-year old gives only 2,835 pounds of milk containing only 95 pounds of fat. A third 2-year old is credited with 4,770 pounds of milk, 3.3 test, and 157 pounds of fat. These low yields are in sharp contrast with that of the last cow in the same column, 6,538 pounds of milk, 205.6 pounds of fat.

It is disappointing to find cows six, seven and eight years old appearing in this list of the poorest cow in each herd. Should not some of them be disposed of, or would they give better yields if differently handled?

The average yield of the best individual cow in each of the twelve herds stands at 8,447 pounds of milk, 321 pounds of fat; the average of all the lowest yields is only 4,068 pounds of milk, 179 pounds of fat; thus the average difference between the highest and lowest yield in each herd is 4,379 pounds of milk and 142 pounds of fat. Computing fat at 30 cents per pound, this indicates an average difference of \$42.60 in the earning power of the best and poorest cow in each herd. This difference would be far greater if it were not for the appearance of the Richmond cow, with her yield of 6,538 pounds of milk, in this column of low yields: the production of this cow is higher than that of the three 'best' cows in the Comox and Cowichan associations.

The difference of \$42.60 just noted is indicative of the urgent need of selection based on records of individual performance.

There are 218 cows included in this table with an average production of 246 pounds of fat. The average yield of fat from the poorest cow in each herd therefore falls just 67 pounds below, or about twenty dollars worth of fat. Assuming that there are 22,000 cows in the province, and that at least half of them could be made to yield, not twenty, but only ten dollars worth more butter fat, this would give an *additional income of one hundred and ten thousand dollars.*

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TABLE CIX.—Comparisons between Herds of Four Cows and over in the Province of British Columbia, for a period of production of Eight Months, 1908.

| Name of Association. | Herd No. | No. of Cows. | TOTAL YIELD OF HERD. | | | AVERAGE YIELD PER COW. | | | YIELD OF BEST COW. | | | YIELD OF POOREST COW. | | |
|----------------------|----------|--------------|----------------------|---------|------|------------------------|-------|-------|--------------------|-------|-------|-----------------------|-------|-------|
| | | | Milk. | Lbs. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. | Milk. | Test. | Fat. |
| | | | | Lbs. | | | | | | | | Lbs. | | |
| Chilliwack..... | A | 8 | 37,028 | 1,189.5 | | 4,628 | 3.2 | 148.7 | 6,665 | 2.9 | 190.9 | 3,411 | 3.5 | 119.7 |
| Cowichan..... | A | 5 | 21,200 | 822.2 | | 4,240 | 3.9 | 164.4 | 5,245 | 3.8 | 201.1 | 4,085 | 3.3 | 135.2 |
| " | B | 4 | 13,895 | 556.0 | | 3,474 | 4.0 | 139.0 | 4,020 | 3.9 | 157.7 | 3,435 | 4.0 | 136.0 |
| Comox | A | 4 | 20,968 | 787.6 | | 5,242 | 3.7 | 194.9 | 6,860 | 3.3 | 226.9 | 4,140 | 3.6 | 149.7 |
| " | B | 5 | 17,615 | 741.0 | | 3,523 | 4.2 | 148.2 | 4,665 | 3.6 | 168.5 | 2,640 | 3.8 | 101.4 |
| " | C | 4 | 20,123 | 850.0 | | 5,032 | 4.2 | 212.5 | 6,515 | 3.8 | 248.0 | 2,490 | 4.5 | 111.9 |
| Eden Bank..... | A | 4 | 22,780 | 829.2 | | 5,695 | 3.6 | 207.3 | 6,670 | 3.6 | 241.0 | 4,120 | 4.0 | 167.8 |
| " | B | 7 | 30,268 | 1,257.9 | | 4,324 | 4.1 | 179.7 | 5,750 | 3.5 | 202.9 | 3,330 | 4.6 | 155.1 |
| Averages and Totals | ... | 41 | 183,882 | 7,033.4 | | 4,485 | 3.8 | 171.5 | 5,799 | 3.5 | 204.6 | 3,456 | 3.9 | 134.6 |



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The average yield of the forty-one cows in table 109 is 4,485 pounds of milk and 171.5 pounds of fat; the lowest herd average is 3,474 pounds of milk and 139 pounds of fat, while the highest is 5,695 pounds of milk and 207.3 pounds of fat. In the column headed 'total yield of herd' will be seen how this difference affects the total. The four cows in herd A at Eden Bank produce 8,885 pounds of milk and 273.2 pounds of fat *more* than the four cows in herd B at Cowichan. This is equivalent to a difference of at least \$22 in the earning power per cow in eight months.

While three old cows appear in the column of poorest yields, a 13-year-old is to be found as a 'best' cow at Eden Bank, giving 6,670 pounds of milk and 241 pounds of fat.

An average difference of 2,343 pounds of milk between the best and the poorest cow in the eight herds indicates the opportunity that exists, and should be taken advantage of, to bring all the cows in the herd nearer to a good uniform level of attainment.

ASSOCIATIONS IN NEW BRUNSWICK.

TABLE CX.—Total and Average Yield of 73 Cows tested Seven Months, 1908.

| Associations. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Penobsquis. | 16 | 44,702 | 2,078.9 | 2,793 | 4.6 | 129.9 |
| Sussex. | 32 | 113,862 | 4,768.4 | 3,558 | 4.2 | 149.0 |
| Springhill. | 6 | 10,270 | 470.1 | 2,054 | 4.6 | 94.0 |
| Petitcodiac. | 20 | 60,022 | 2,290.0 | 3,001 | 3.8 | 114.9 |
| Totals and averages..... | 73 | 228,856 | 9,616.4 | 3,135 | 4.2 | 131.7 |

If butter fat is valued at 20 cents per pound, the twenty cows at Petitcodiac should have earned \$136 *more* than they did to bring them up to the standard of the cows at Sussex.

TABLE CXI.—Total and Average Yield of Two Cows tested Eight Months.

| Association. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Sussex. | 2 | 8,605 | 288.2 | 4,302 | 3.3 | 144.1 |

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TABLE CXII.—The yields of 75 Individual Cows for periods of Seven and Eight Months in New Brunswick Associations are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | Total Number of Cows. | Number of Herds Represented. | Number of Associations. |
|----------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------|------------------------------|-------------------------|
| | 1,000 to 2,000 | 2,000 to 3,000 | 3,000 to 4,000 | 4,000 to 5,000 | 5,000 to 6,000 | | | |
| 7..... | 4 | 28 | 34 | 6 | 1 | 73 | 12 | 4 |
| 8..... | | | | 2 | | 2 | 1 | 1 |
| Total number of cows | 4 | 28 | 34 | 8 | 1 | 75 | | |

TABLE CXIII.—Comparisons between Two Herds in Penobsquis, New Brunswick, Association for Seven Months, 1908.

| Herd. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 9 | 2,811 | 5·0 | 140·3 | ..... | 3,795 | 4·2 | 158·5 | ..... | 2,290 | 4·4 | 99·7 |
| B | 6 | 2,791 | 4·7 | 132·6 | 4 | 3,080 | 5·0 | 154·0 | 4 | 2,390 | 4·8 | 115·3 |

TABLE CXIV.—Contrast, Penobsquis, New Brunswick, Association.

| | Lbs. Milk. | Lbs. Fat. | Age of Cow. |
|----------------------------|------------|-----------|-------------|
| 7 months, best yield | 3,795 | 158·5 | |
| 7 " poorest yield. | 2,495 | 119·4 | 12 years. |

TABLE CXV.—Comparisons between Herds in Petiteodiac, New Brunswick, Association for Seven Months, 1908.

| Herd. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 5 | 2,215 | 4·9 | 109·5 | 10 | 2,972 | 4·8 | 143·7 | 2 | 1,613 | 5·3 | 85·3 |
| B | 5 | 3,521 | 3·5 | 122·0 | 6 | 3,900 | 3·4 | 133·2 | 3 | 2,766 | 3·6 | 98·8 |
| C | 5 | 3,097 | 3·5 | 109·4 | 2 | 3,415 | 3·2 | 109·1 | 4 | 2,750 | 3·9 | 107·8 |
| D | 5 | 3,171 | 3·7 | 118·8 | 5 | 4,430 | 3·9 | 172·3 | 2 | 2,380 | 3·8 | 90·6 |

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The average difference between the best and the poorest yields in these four herds is 1,302 pounds of milk and 44 pounds of fat in the seven months.

Note that the highest yield in herd C is from a 2-year-old heifer, while the lowest yield in the same herd is from a 4-year-old.

TABLE CXVI.—Contrast, Petitcodiac, New Brunswick, Association.

| | Lbs. Milk. | Lbs. Fat. | Age of Cow. |
|-----------------------------|------------|-----------|-------------|
| 7 months, best cow. | 4,430 | 172.3 | 5 years. |
| 7 " poorest cow. | 2,481 | 115.5 | 6 " |

TABLE CXVII.—Comparisons between herds in Sussex, New Brunswick, Association for Seven Months, 1908.

| Herd. | No. of Cows in Herd. | HERD AVERAGE | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|----------------------|--------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 6 | 3,396 | 3.5 | 119.5 | 7 | 3,680 | 4.0 | 145.9 | 6 | 2,870 | 3.2 | 92.3 |
| B | 6 | 3,205 | 4.5 | 144.5 | 4 | 3,620 | 4.7 | 169.2 | 6 | 2,770 | 4.2 | 115.0 |
| C | 7 | 4,165 | 4.1 | 169.6 | 6 | 5,120 | 3.6 | 182.8 | 7 | 3,580 | 5.0 | 179.8 |
| D | 10 | 3,731 | 4.3 | 162.0 | 9 | 4,640 | 5.0 | 233.9 | 2 | 2,510 | 4.5 | 112.6 |

In herd B the difference in yield between the best and poorest cow is 54 pounds of fat.

In herd C the difference is 2,130 pounds of milk.

TABLE CXVIII.—Contrast, Sussex, New Brunswick, Association.

| | Milk. | Fat. | Age of Cow. |
|-----------------------------|-------|-------|-------------|
| | Lbs. | Lbs. | |
| 7 months, best cow. | 5,120 | 182.8 | 6 |
| 7 " poorest cow. | 2,482 | 102.4 | 8 |

The difference between these two cows amounts to 2,638 pounds of milk and 80.4 pounds of fat in seven months.

ASSOCIATIONS IN PRINCE EDWARD ISLAND.

TABLE CXIX.—Total and average yield of Eleven Cows tested Seven Months, 1908.

| Associations. | No. of Cows. | Total Yield of Milk. | Total Yield of Fat. | Average Yield of Milk. | Average Test. | Average Yield of Fat. |
|--------------------------|--------------|----------------------|---------------------|------------------------|---------------|-----------------------|
| | | Lbs. | Lbs. | Lbs. | | Lbs. |
| Marshfield. | 6 | 22,128 | 907 1 | 3,688 | 4·1 | 151·1 |
| New Glasgow..... | 5 | 18,682 | 623·7 | 3,736 | 3·3 | 124·7 |
| Totals and averages..... | 11 | 40,810 | 1,530·8 | 3,710 | 3·7 | 139·1 |

TABLE CXX.—Total and average yield of 13 Cows tested Eight Months, 1908.

| | | | | | | |
|------------------|----|--------|---------|-------|-----|-------|
| Marshfield. | 13 | 61,245 | 2,292·1 | 4,711 | 3·7 | 176·3 |
|------------------|----|--------|---------|-------|-----|-------|

TABLE CXXI.—Total and average yield of 15 Cows tested Nine Months, 1908.

| | | | | | | |
|-----------------|----|--------|---------|-------|-----|-------|
| Marshfield..... | 15 | 67,372 | 2,635·8 | 4,491 | 3·9 | 175·7 |
|-----------------|----|--------|---------|-------|-----|-------|

TABLE CXXII.—Total and average yield of 5 Cows tested Ten Months, 1908.

| | | | | | | |
|------------------------|---|--------|---------|-------|-----|-------|
| Marshfield. ... | 4 | 21,803 | 828·4 | 5,450 | 3·8 | 207·1 |
| New Glasgow. . | 1 | 5,887 | 191·6 | 5,887 | 3·3 | 191·6 |
| Totals and averages. . | 5 | 27,690 | 1,023·0 | 5,538 | 3·7 | 201·6 |

TABLE CXXIII.—Total and average yield of 5 Cows tested Twelve Months, 1908.

| | | | | | | |
|---------------------------|---|--------|---------|-------|-----|-------|
| Marshfield. | 3 | 16,891 | 609·6 | 5,630 | 3·6 | 203·2 |
| New Glasgow..... | 2 | 11,003 | 395·5 | 5,502 | 3·6 | 197·8 |
| Totals and averages. | 5 | 27,894 | 1,005·1 | 5,578 | 3·6 | 201·0 |

TABLE CXXIV.—Comparisons between two herds in Marshfield, P.E.I., Association for Nine Months, 1908.

| Herd. | No. of Cows. | HERD AVERAGE. | | | YIELD OF BEST COW. | | | | YIELD OF POOREST COW. | | | |
|-------|--------------|---------------|-------|-------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. | Age. | Milk. | Test. | Fat. |
| | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. | | Lbs. |
| A | 4 | 4,005 | 3·8 | 176·0 | 4 | 5,315 | 3·8 | 206·4 | 3 | 4,080 | 4·0 | 163·8 |
| B | 4 | 3,237 | 4·3 | 138·4 | 8 | 4,067 | 4·3 | 176·1 | 3 | 2,720 | 4·2 | 114·2 |

In herd B the 3-year-old is 1,340 pounds of milk and 61·9 pounds of fat lower than the record of the best cow in that herd.

There is also a marked difference in the average yields of these two herds.

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TABLE CXXV.—Contrasts, Marshfield, P.E.I., Association.

| | Lbs. Milk. | Lbs. Fat. | Age of Cow. |
|-------------------------------|------------|-----------|-------------|
| 9 months, best cow | 6,889 | 251·2 | 5 years. |
| 9 " poorest cow | 3,127 | 122·8 | 10 " |
| Same herd, 8 months, best cow | 6,647 | 244·8 | 5 " |
| " 8 " poorest cow | 2,512 | 102·9 | 7 " |

The above two poor yields indicate the necessity for discovering individual performance by means of weights and samples. What profit did these two cows give?

TABLE CXXVI.—Contrasts, New Glasgow, P.E.I., Association.

| | Lbs. Milk. | Lbs. Fat. | Age of Cow. |
|--------------------------------|------------|-----------|-------------|
| 7 months, best cow | 5,395 | 166·4 | 3 years. |
| 7 " poorest cow | 3,036 | 100·9 | 3 " |
| Same herd, 12 months, best cow | 6,418 | 217·9 | 6 " |
| " 12 " poorest cow | 4,585 | 177·6 | 12 " |

TABLE CXXVII.—The yields of 49 Individual Cows for periods of 7, 8, 9, 10 and 12 months in Prince Edward Island Associations are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | | | Total Number of Cows. | Number of Herds Represented. | Number of Associations. |
|----------------------|--------------------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|------------------------------|-------------------------|
| | 2,000 to 3,000 Lbs. | 3,000 to 4,000 Lbs. | 4,000 to 5,000 Lbs. | 5,000 to 6,000 Lbs. | 6,000 to 7,000 Lbs. | | | |
| 7 | 1 | 6 | 3 | 1 | | 11 | 5 | 2 |
| 8 | 1 | 3 | 3 | 5 | 1 | 13 | 5 | 1 |
| 9 | 1 | 2 | 8 | 2 | 2 | 15 | 5 | 1 |
| 10 | | | 1 | 3 | 1 | 5 | 4 | 2 |
| 12 | | | 1 | 3 | 1 | 5 | 2 | 2 |
| Total number of cows | 3 | 11 | 16 | 14 | 5 | 49 | | |

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TABLE CXXVIII.—The yields of 14 Individual Cows for Full Period of Lactation in 8, 9, 10 and 11 months in Prince Edward Island Associations are classified as follows:—

| Number of Months. | TOTAL YIELD OF MILK IN POUNDS. | | | Total Number of Cows. | Number of Herds Represented. | Number of Associations. |
|------------------------|--------------------------------|-----------------|-----------------|-----------------------|------------------------------|-------------------------|
| | 3,000 to 4,000. | 4,000 to 5,000. | 5,000 to 6,000. | | | |
| | No. of Cows. | No. of Cows. | No. of Cows. | | | |
| 8..... | 1 | ..... | 1 | 2 | 2 | 2 |
| 9..... | ..... | 1 | 3 | 4 | 1 | 1 |
| 10 | 2 | ..... | 3 | 5 | 3 | 2 |
| 11..... | ..... | ..... | 3 | 3 | 3 | 2 |
| Total number of cows.. | 3 | 1 | 10 | 14 | | |

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

FOR THE

FISCAL YEAR ENDING MARCH 31

1909

PART II—REPORT OF THE ASSISTANT DAIRY COMMISSIONER.

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*Summary of Work—The Planting of a Family Orchard in Eastern Quebec—Dairy-
men's Convention—Agriculture as a Career for our Young Men—Horticulture—
Lectures to Farmers' Clubs—Factory Syndicate Inspection.*

PART II.—REPORT OF THE ASSISTANT DAIRY COMMISSIONER.

(Mr. J. C. CHAPAIS.)

ST. DENIS (EN BAS), COUNTY OF KAMOURASKA, P.Q.,
March 31, 1909.

Mr. J. A. RUDDICK,
Dairy and Cold Storage Commissioner,
Ottawa.

SIR,—I beg leave to present you my nineteenth report as Assistant Dairy Commissioner, which covers the period of twelve months between April 1, 1908, and March 31, 1909.

SUMMARY OF WORK.

During the last twelve months, with the exception of one visit to Ottawa, I have devoted all my time to the province of Quebec, and have made 138 visits to 75 localities in 21 counties. I have delivered 220 lectures before 13,702 persons, 295 of whom were butter and cheese makers. The average attendance at these lectures was sixty-two persons. Of the seventy-five localities, I visited thirteen for the first time. I have travelled 6,172 miles in performing my work.

The following is a list of the counties and localities in which I have delivered lectures, with reference letters indicating the purpose of the meetings:—

TABLE OF VISITS AND LECTURES.
PROVINCE OF ONTARIO.

| Counties. | Localities. | Visits. | Lectures. | Reference Letters. |
|----------------|--------------|---------|-----------|--------------------|
| Carleton | Ottawa | 2 | 2 | a, e |

PROVINCE OF QUEBEC.

| | | | | |
|----------------------|------------------------------|---|----|------|
| Arthabaska | Victoriaville | 1 | 2 | a |
| Bellechasse... .. | St. Charles | 2 | 3 | b, c |
| | St. Damien | 1 | 1 | c |
| | St. Gervais..... | 1 | 1 | c |
| | St. Lazare | 1 | 1 | c |
| | St. Raphael..... | 1 | 1 | c |
| Berthier..... | St. Damien | 4 | 8 | d |
| | St. Gabriel..... | 2 | 4 | d |
| Huntingdon..... | Covey Hill..... | 1 | 1 | a, e |
| | Hemmingford..... | 1 | 1 | a, e |
| Jacques Cartier..... | Macdonald College | 1 | 1 | a, e |
| Joliette..... | St. Ambroise de Kildare..... | 1 | 2 | d |
| | St. Cleophas | 1 | 2 | d |
| | St. Felix de Valois | 1 | 2 | d |
| | St. Jean de Matha..... | 8 | 15 | f, g |
| | Ste. Beatrice..... | 2 | 4 | d |
| | Ste. Elizabeth..... | 2 | 4 | d |
| | Ste. Emelie..... | 5 | 10 | d |
| | Ste. Melanie..... | 4 | 8 | g |

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PROVINCE OF QUEBEC—*Continued.*

| Counties. | Localities. | Visits. | Lectures. | Reference Letters. |
|---------------------|--------------------------------|---------|-----------|--------------------|
| Kamouraska | Kamouraska..... | 2 | 3 | c, g |
| | Mont-Carmel..... | 3 | 5 | c, g |
| | Rivière Ouelle..... | 2 | 3 | c, g |
| | St. Alexandre..... | 4 | 8 | c, g |
| | St. André..... | 3 | 5 | c, g |
| | St. Bruno..... | 2 | 3 | c, g |
| | St. Elenlhère..... | 1 | 2 | g |
| | St. Germain..... | 2 | 3 | c, g |
| | St. Onésime..... | 2 | 2 | g |
| | St. Pacôme..... | 5 | 7 | b, c, g |
| | St. Pascal..... | 2 | 3 | c, g |
| | St. Philippe de Néri..... | 2 | 3 | c, g |
| | Ste. Anne de la Pocatière..... | 3 | 5 | c, f, g |
| | Ste. Hélène..... | 4 | 7 | c, g |
| Lévis..... | St. Romuald..... | 1 | 1 | b |
| L'Islet | L'Islet..... | 1 | 1 | c, f |
| | St. Aubert..... | 1 | 1 | c |
| | St. Cyrille..... | 1 | 1 | c |
| | St. Eugène..... | 1 | 1 | c |
| | St. Jean Port Joli..... | 1 | 1 | c |
| | St. Roch des Aulnaies..... | 1 | 1 | c |
| | Ste. Louise..... | 1 | 1 | c |
| Lotbinière..... | St. Jean Deschaillons..... | 1 | 2 | g |
| Megantic..... | Lyster..... | 1 | ..... | ..... |
| Montmagny..... | Cap St. Ignace..... | 1 | 1 | c |
| | Montmagny..... | 1 | 1 | b |
| | Notre Dame du St. Rosaire..... | 1 | 1 | c |
| | St. Francois..... | 2 | 2 | c, f |
| | St. Pierre..... | 1 | 1 | c |
| | St. Euphemie..... | 1 | 2 | c |
| Montmorency..... | Chateau Richer..... | 1 | 1 | b |
| Nicolet..... | Bécancour..... | 6 | 11 | b, g |
| | Gentilly..... | 3 | 6 | g |
| | Précieux Sang..... | 1 | 2 | g |
| | St. Grégoire..... | 6 | 12 | g |
| | St. Pierre les Becquets..... | 2 | 4 | g |
| | Ste. Angèle..... | 2 | 4 | g |
| | Ste. Gertrude..... | 3 | 6 | g |
| | Ste. Marie de Blandford..... | 1 | 2 | g |
| Quebec..... | Charlesbourg..... | 1 | 2 | b |
| Richmond..... | Asbestos..... | 1 | 1 | c |
| | Danville..... | 1 | 1 | d |
| | St. George de Windsor..... | 1 | 1 | c |
| Témiscouata | Notre Dame du Portage..... | 1 | 2 | g |
| | St. Antonin..... | 1 | 2 | g |
| Two Mountains | La Trappe, Oka..... | 2 | 4 | a, f |
| Vaudreuil..... | Rigaud..... | 1 | 1 | b |
| Wolfe..... | North Ham..... | 1 | 1 | c |
| | South Ham..... | 1 | 1 | c |
| | Notre Dame de Ham..... | 1 | 1 | c |
| | St. Adrien de Ham..... | 1 | 1 | c |
| | St. Camille de Wotton..... | 1 | 1 | c |
| | St. Fortunat..... | 1 | 1 | c |
| | St. Julien..... | 1 | 1 | c |
| | Wotton..... | 1 | 1 | c |
| 21 | 75 | 138 | 220 | |

Reference letters indicate:—(a) Provincial meetings. (b) County and district meetings. (c) Farmer's club meetings. (d) Parish meetings. (e) English lectures. (f) Visits to colleges and schools. (g) Factory inspections and lectures.

This table shows that I have delivered (a) eleven lectures at provincial meetings; (b) twelve at county and district meetings; (c) forty at farmers' club meetings; (d) one at a parish meeting; (e) five lectures in English; (f) seven in colleges and schools; and that I have made seventy-seven factory inspections, in the course of which I have delivered 154 lectures to the factory patrons.

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PROVINCIAL MEETINGS.

The first of the provincial meetings I attended during the past twelve months was the summer meeting of the Pomological and Fruit Growing Association of the province of Quebec, held at Hemmingford and Covey Hill, Huntingdon county, on the twelfth and thirteenth of August, 1908.

I may say here that, as we have a fruit division in the Dairy and Cold Storage Commissioner's Branch of the Department of Agriculture at Ottawa, I am often requested to deliver lectures on various topics relative to fruit culture and forestry. At the Huntingdon county convention, just mentioned, I delivered the following lecture.

THE PLANTING OF A FAMILY ORCHARD IN EASTERN QUEBEC.

'As a member of the Pomological and Fruit Growing Association of the province of Quebec, I have always considered it my duty to give all the information possible to members, and even outsiders, who apply for it. That is why I am here to-day to give a lecture on the planting of family orchards. I do it in order to reply to many questions often asked by members in the eastern part of our province, who suppose I can answer them, knowing that I live in that district and that I own an extensive orchard, to which I have often had occasion to refer in the reports of our society. I do it all the more willingly because I have always advocated the planting of an orchard on every farmer's land.

'From the western boundary of our province, as far as the gulf, with the exception of the Lake St. John region and the district contiguous to it on the west, in the same latitude, we can grow grafted apple trees if we make a good selection of those suitable for the various latitudes. With respect to my own district, I have for a long time had the proof of my assertion. To-day I wish to explain in a few words how to plant, almost anywhere in the eastern part of the province, with the exception I have just mentioned, an orchard which will provide enough fruit of various kinds to permit of an agreeable and wholesome element of variety in the family diet.

SITE AND SOIL.

'The section I have in mind in writing this paper is the one lying east of a line drawn on the map of the province of Quebec, from top to bottom, passing 72 degrees 30 minutes of longitude, through the city of Three Rivers, on the north shore of the St. Lawrence, and through about the middle of Compton county, on the southern boundary line of the province. In that section we must select a light, rather than a heavy soil; a well drained piece of land and a site offering shelter from eastern winds.

SIZE OF THE ORCHARD.

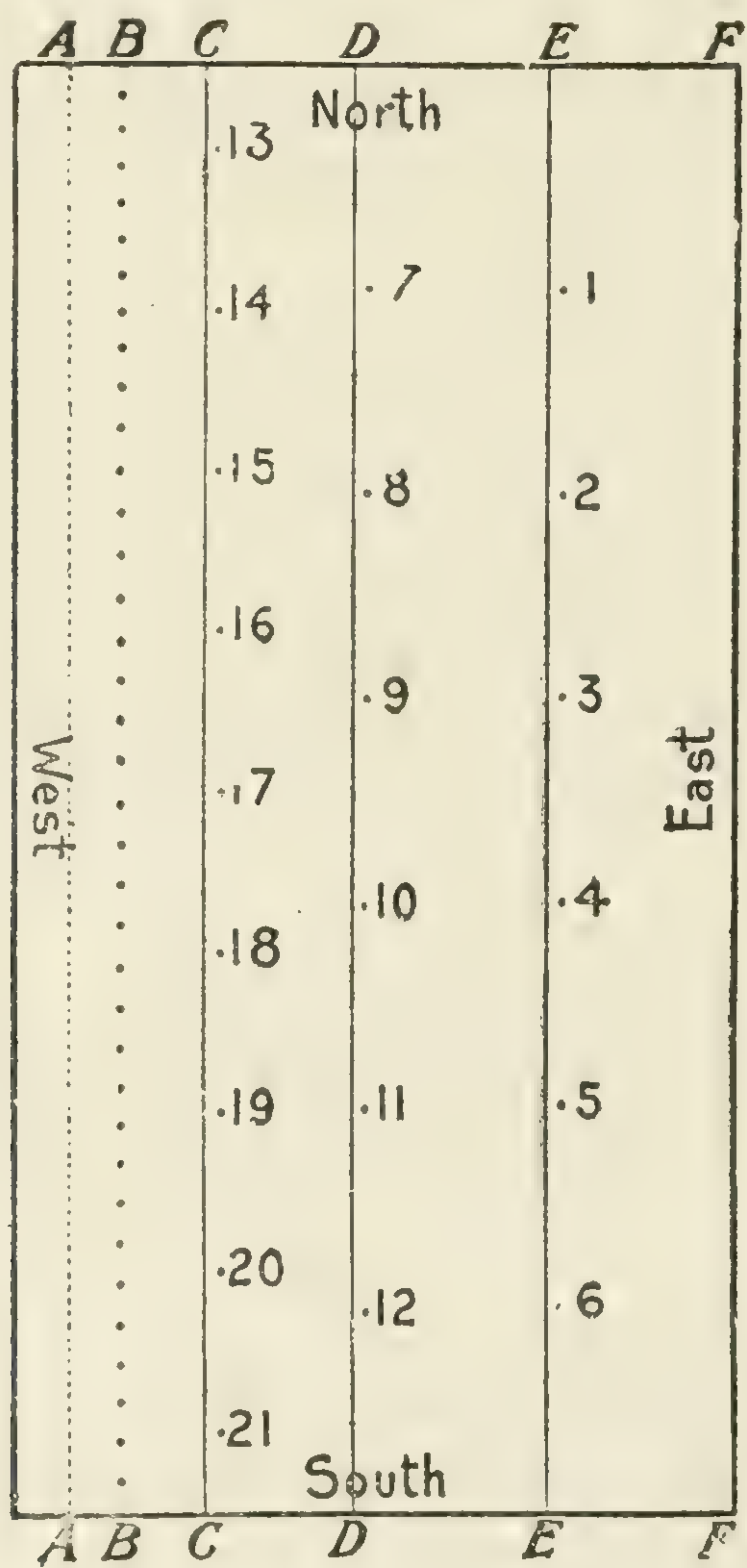
'From what we know about the number of persons in the average eastern family, we count eight persons for each home, including hired help. For such a family a piece of land measuring an arpent in length by half an arpent in width, in orchard, to contain the various kinds of large and small fruits, would provide enough fruit for one year. We give here an outline of the plan of such an orchard, with reference figures and letters showing how it should be planted. We use the arpent for measure because it is the common measure used by all land owners in the greater part of the district about which we are writing.

'The square arpent is 180 by 180 French feet and covers an area of 32,500 square feet, giving for half an arpent an area of 16,200 French square feet. For the information of those who would like to make a comparison between an arpent and an acre, let us say that the acre is 1.1937 arpents and an arpent is .8380 of an acre.

'The French foot is 12.79 English inches; so that the arpent is really 191.85 English or Canadian feet in length.

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‘In the outline of the orchard given in the accompanying diagram, the line FF, which is the eastern limit of the orchard, must in most cases, except where the site offers a natural shelter from eastern winds, be made a hedge of spruces placed three feet apart and not more than 20 inches in growth, in order to insure success. The line EE is to be planted with apple trees 25 feet apart from each other and in rows 25 feet apart. The same thing is to be done with line DD. Line CC will be planted with plum and cherry trees. This line is placed at a distance of 20 feet from line



DD, and the trees in it are also placed 20 feet apart. The next line, BB, is at a distance of 10 feet from the last one, and is to be planted with small fruit bushes five feet apart. Lastly, the dotted line AA is planted with strawberries, the plants being placed 18 inches apart, and the row being 5 feet from the one planted with small fruit bushes.

‘Here is the most important part of the present paper, since the selection of varieties is chiefly the key to success.

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‘In line EE are to be planted, at the points marked 1 and 2, Yellow Transparent apple trees, at 3 and 4 Lowland Raspberry, and at 5 and 6 Duchess.

‘In line DD, at points 7 and 8, should be planted Alexander, at 9 and 10 Fameuse, and at 11 and 12 Wealthy.

‘In line CC are to be planted, at points 13 and 14, plum trees of the Blue Damsion variety, at 15 and 16 Reine Claude de Montmorency, and at 17 one Early Yellow.

‘In the same line CC, at points marked 18 and 19 should be planted two Early Richmond, and at points 20 and 21, two Montmorency cherry trees.

‘Line BB is to receive 36 bushes of small fruits, consisting of nine Downing gooseberries, nine Fay’s Prolific red currants, nine Black Champion currants and nine Marlborough red raspberries.

‘The last line, AA, will be a row of 120 Sharpless and Williams strawberry plants.

‘We would advise farmers to plant another piece of land by itself in those varieties of small fruits.

‘I have only two remarks to make in explanation of two points alluded to in the present paper. The first one is about the selection of varieties. All the varieties of fruit mentioned have been subjected to experimental culture during the last twenty years in many localities in the eastern section of the province of Quebec, and have always proved satisfactory. It is to be hoped that a similar paper regarding the western part of the province will be given by those who have had experience in that section.

‘The second remark is about the distance that apple trees should be planted apart from each other. I can only repeat what I wrote in another of my lectures on that subject; we have already advocated never having more than 25 feet between apple trees in a row. Now, we know that 40 feet is the distance generally recommended. We found that in our severe climate they must be planted close together, in order to offer protection from the heavy, damp winds of our region. We are often told that when planted as close as that they soon intermingle their branches, prevent the fruit from getting enough air and light and are an obstacle to the cultivation and spraying of the orchard. To this we answer that there is so much difference between our climate and that of the west of the province that none of those disadvantages of close planting are to be feared. We have seen in the County of Essex, in Ontario, an orchard of twenty years’ growth, where the trees were set 40 feet apart and had all their branches intermingled, so that not a ray of sunshine could reach the ground. We have seen around Montreal a few orchards planted in the same way for twenty years, in which the trees were not yet intermingling their branches. Then, we have in our own orchard, on good, rich and well drained land, trees planted for twenty years, 25 feet apart, and having as yet no intermingling branches. This shows the great difference there is in the growth of trees in different climates. Let western people plant their apple trees 40 feet apart, but let us plant ours 25 feet. Both systems are beneficial where they are needed.’

DAIRYMEN’S CONVENTION.

On January 7 and 8, 1909, I attended the second provincial meeting for the present fiscal year, at Victoriaville, where the 27th annual convention of the Dairymen’s Association of the province of Quebec was held, and I delivered a lecture on ‘Water in Connection with Dairying.’ This lecture being rather lengthy, I will give only a short synopsis of it here. The whole of it is printed in the annual report of the Dairymen’s Association.

WATER IN CONNECTION WITH DAIRYING.

‘Importance of water in connection with the dairy industry.—Necessity of water for the growth of plants for feeding cattle.—Usefulness of water in the feeding of

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the dairy cow.—Necessity of giving only pure water to the cows.—Quantity of water necessary for the dairy cow.—Bad effect of the lack of water in the feeding of the dairy cow.—Bad effect of poor water in the feeding of the dairy cow.—How to water the cows.—Temperature of the water given to cows.—Water for the cooling and heating of milk.—Water for the cleaning of butter and cheese factories and of the utensils used in making these products.—Necessity of having water as pure as possible for filling boilers.—Notes on the water used for washing butter and curds.—Water for the use of butter and cheese makers.—Study of the influence of forests on the distribution of water, considered as one of the most important factors of the dairy industry'.

At the same convention I submitted an article published in 'Hoard's Dairyman' of December 18, 1908, which shows that the use of farm separators is becoming a menace to the dairy industry on account of the fact that, contrary to the hope entertained by many dairymen that these machines would be beneficial to dairying, they are proving to be a cause of poor buttermaking, because farmers who use them do not understand the necessity of keeping them clean and of taking good care of their cream, some farmers going so far that they consider it more important to get better skimmed milk for their animals and have to convey their cream only once or twice a week to the factory than to get first class butter from that cream. I submitted that article to the meeting because one of the lecturers at the convention had expressed the same opinion in regard to our own dairy interests, and in order to give a warning to some of our dairymen who are very negligent about the use of their separators and the care of their cream.

AGRICULTURAL INSTITUTE AT OKA.

The third provincial meeting I attended was that held at Oka, for the inauguration of the Agricultural Institute of the Trappist Fathers of 'La Trappe,' which took place on February 9th. This meeting was followed, at the same place, by a meeting of all the agricultural lecturers of the Quebec Department of Agriculture. I was invited to deliver a lecture at the inauguration of the institute and two addresses at the meeting of the agricultural lecturers, which was held on February 10th, 11th, 12th and 13th. My lecture at the inauguration was entitled, 'Agriculture as a Career for Our Young Men.' I gave it specially for the sake of the students of the institute. The following is the text of that lecture:—

AGRICULTURE AS A CAREER FOR OUR YOUNG MEN.

'For a long time agriculturists and rural economists have been studying the question of teaching agriculture in schools. As agriculture is suffering for want of manual labour, on account of the migration of farm workers to the towns and manufacturing centres and on account of the aversion felt by many farmers' sons towards the calling of their parents, it has been thought that it would be useful to have a lecture delivered in the colleges and the larger rural schools on the advantages that agriculture offers as a career to the young men of our country. The provincials of seven teaching institutions of brothers in the province of Quebec, who have under their direction a great number of colleges and schools, and also many of the superiors of classical colleges in the country, asked me some years ago to devote a little of my time, along with my ordinary work, to delivering to their pupils a lecture of that kind, and I have complied with their wish.

'Since the year 1900, I have visited 58 colleges and schools for that purpose and have delivered before 8,500 people a lecture which I think should be useful here this evening to an audience composed of men whose mission is to work for the diffusion of principles tending to develop the love of the land amongst the agricultural class, which it is their duty to teach.

'The only perfect man who ever lived in this world, with the exception of God as man, was Adam before his fall. Now, Adam was a cultivator. Consequently, agriculture has the noblest and oldest origin. All the great patriarchs of the Old Testa-

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ment were shepherd-kings and therefore farmers. The nations of antiquity, such as the Egyptians, the Greeks, the Romans, ascribed much honour to agriculture. We see that many of the most famous warriors, such as Cincinnatus, the Roman, left the plough to fight for their country and save it from its enemies and then came back to their fields. Even now, the greatest names of France, Russia, England, &c., are enrolled on the lists of the great national agricultural societies and seek to win at exhibitions the highest prizes for the produce of their lands and animals. Thus we see in the lists of prize winners at the exhibitions of the Royal Agricultural Society of England, the names of the late illustrious Queen Victoria and of her son Edward VII, our glorious King.

‘Our ancestors were, most of them, farmers and it is through the cultivation of the soil that they have left us a great and prosperous country. Every agricultural country becomes rich and its population is strong and vigorous. On the other hand, a nation that lays aside agriculture loses its wealth and strength. If we wish to see industry and commerce prosperous, we must continue to give predominance to agriculture, which should always occupy the first place in the attention and favour of governments.

‘The tiller of the soil is strong, vigorous, independent and happy, more than any other individual in society. The farmer is the foster father of mankind and in that capacity cannot be dispensed with by society. Without the farmer nobody can perform the mission assigned to him by God in this world, because men must eat in order to live and work, and it is the farmer that feeds mankind. It is a mistake to believe that a farmer can be ignorant with impunity. To be a good farmer he has need of all sciences, though often without knowing it. Geology, botany, entomology, chemistry, mechanics, meteorology, &c., are all sciences which contribute to success in agriculture. Still worse is the prejudice that leads our young people to believe that it is humiliating to go back to the tillage of the soil after having got the advantage of an education. The better educated a farmer is, the better farmer is he. After the ministers of religion, the tiller of the soil occupies the first place in society. The proof of this is given by God Himself, Who leaves the lawyer, the doctor, the notary, the artist, the workmen, &c., to begin, continue and complete their work without aid, from the material point of view, while to the tiller of the soil alone he gives his immediate help to make the crop of grain, the seed of which the farmer has sown, grow and mature, and this crop the farmer has afterwards only to reap.’

May I be allowed to quote here an appreciation of the lecture which I have just summarized, as it appeared in one of the great daily newspapers of this province.

‘Agriculture in Schools.—For the past few years Mr. J. C. Chapais, Assistant Dairy Commissioner, has delivered lectures on the dignity, importance and advantages of agriculture, in educational institutions, in commercial colleges and even in some of the classical colleges in the country. This is an excellent movement, which augurs well for the future of agriculture and, consequently, of our country, which has been and must remain an agricultural country in order to continue its grand and noble mission.

‘We must teach the growing generation to love and honour agriculture; we must teach it the history of agricultural nations.

‘When the child understands well the important part played by agriculture in this world and the dignity of his position as a farmer’s son, the prejudice that agriculture is inferior to other occupations will be eradicated.’

In this appreciation there are three words that I wish to emphasise, because they suggest to me a few remarks. These words are, ‘*in commercial colleges.*’ There is nothing to be said against delivering lectures in the commercial colleges of cities and towns, to demonstrate to young men that agriculture may be for some of them an advantageous and noble career; but a thing to be deplored is that we have to deliver such lectures in rural commercial colleges. Nobody has ever thought of establishing

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agricultural schools in cities. Why, then, are commercial colleges established in the country? (The reference is to the province of Quebec. J. A. R.)

Without entering into a discussion of that 'why,' let us say that it is painful for the friends of agriculture to note that our teaching institutions establish such commercial colleges in the country and offer to our farmers a programme in which it is claimed that after taking a three or four years' course their sons are competent to work in banks, factories, stores, railway stations, and government offices, and earn good salaries.

Everybody knows that the boys that are sent to take such courses in those colleges are selected from amongst the most intelligent in each family. Hence follows a constant drain of the best element of the agricultural class, to the great detriment of agriculture and for the benefit of the urban population.

Let us have many country colleges; there is no objection to that; but let them not bear the name 'commercial college,' and do not allow them to allure the pupils by the glamour of that essentially commercial education which, once acquired, makes them believe that they would humble themselves were they to return to the farm from which they came. There is an idea which we submit to the serious attention of our educators who are charged with the education of our rural population.

The day after delivering that lecture I gave another one at the meeting of the agricultural lecturers of Quebec, on Forestry. Reference will be made to that lecture in another part of the present report.

I will mention here a meeting I attended at the Central Experimental Farm, Ottawa, in February and March, where I met the lecturers of the Quebec Farmers' Institutes; and another one, also in Ottawa, where I conferred with Messrs. Barr and Bouchard on the treatment of milk in connection with cheesemaking.

The last provincial meeting I attended was the winter convention of the Quebec Society for the Protection of Plants from Insects and Fungous Diseases. This was held at Macdonald College on March 10th, and I delivered a lecture there on 'Anguilulidae' and especially on one of these worms named 'Teterodera.' These are microscopic worms found in various plants and especially on clover. These worms are known by the common name of eel-worms and have not yet been the subject of much investigation.

COUNTY AND DISTRICT MEETINGS.

I attended, this year, twelve county and district meetings. The first was one for the purpose of organizing a horticultural society in Kamouraska county, and it was held at St. Pacôme, on April 13, 1908. The following is a synopsis of some of the arguments I gave to induce the farmers of Kamouraska county to enter their names in the list of members of the new society.

Horticulture is one of the most important branches of agriculture. It is divided into many branches, which are all of great interest to farmers.

The first branch of horticulture is vegetable gardening. There should be a good sized vegetable garden near the home of every farmer. We generally eat too much meat and bread and we should always have on our tables an ample supply of all kinds of vegetables. All doctors agree on that point.

Then comes market gardening, which is a source of profit for all farmers whose land is in proximity to cities, which always pay well for all kinds of vegetables.

Horticulture has another branch, which may seem less important than the two first mentioned, though it is not. That branch is floriculture, or the culture of flowers. Besides the pleasure derived from that branch of horticulture, the farmer finds in it also a great source of profit, for there is always a great demand on the market for flowers and ornamental plants.

Fruit growing is probably the most important branch of horticulture. Fruit in large quantities should form part of the diet of every family, especially for the sake of the children, who are so fond of it and who benefit so much by its use. A



Edwin Caswell, one of the potato buyers of Ontario, who carried on business at Ingersoll, Ont., for many years.

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well organized small orchard on a farm can furnish fresh fruit on the farmer's table for almost the whole year. Then, there is much profit to be derived from a well kept orchard, as there is always a steady demand on markets for good fruit.

Some may be surprised to hear that bee-keeping is regarded as a branch of horticulture. It is true, nevertheless, and there is good reason for it. Not only does the bee produce honey and wax, but it is also the best agent of fecundation of the blooms on fruit trees and thus assures the orchard owner of a good crop of fruit.

Now, all these are general considerations about horticulture. But there is more than that in it, if we place ourselves at another point of view to discuss its merits. In the eastern districts of the province of Quebec we begin to use our vegetables and fruits much later than they do in the western districts, on account of the lateness of our seasons compared with theirs. To speak only of asparagus, strawberries, cherries and plums, we can put them on the Montreal, Toronto and all western markets a whole month later than they have them from their own districts; so we are sure to get good prices for our late vegetables and fruits.

The only thing to do in order to make a paying business of horticulture in all its branches is to learn it, and the best means of doing that is to become members of our local horticultural societies.

COUNTY MEETINGS.

I held two county meetings, specially called by myself, one at St. Jean de Matha, Joliette county, on June 2nd, and one at Bécancour, Nicolet county, on June 18th. The first one was held to address the buttermakers of Joliette county in a joint meeting with Mr. J. D. Leclair, General Inspector of Creamery Syndicates of the province of Quebec. The second one was held to meet the cheesemakers of Nicolet county in a joint meeting with Mr. Elie Bourbeau, General Inspector of Cheese Factory Syndicates in the same province.

On January 27th, I attended my fourth county meeting for the present year. It was held at Rigaud, Vaudreuil county, where all the farmers' clubs of that county, who have formed among themselves a co-operative society, held their annual convention. I had been specially invited to that meeting by the federal member, Mr. Boyer, to deliver my lecture on forestry, already mentioned in this report.

The fifth county meeting I attended was the second annual meeting of the Horticultural Society of the County of Kamouraska, the first one, for organization, having been held last April, as already mentioned. This second meeting was held at St. Pacôme, on the 19th February last.

The next seven county lectures I delivered this year were given at seven institute meetings, as follows:—One at Montmagny, Montmagny county; two at St. Charles, Bellechasse county; one at Chateau Richer, Montmorency county; two at Charlesbourg, Quebec county, and one at St. Romuald, Lévis county. This year I have taken but little part in these farmers' institutes, having been ailing the whole month of January and part of February on account of an accident which befell me at the end of December, when I had a very bad fall on the ice. Consequently I could not undertake the work I had been appointed to do at the head of my delegation, and I had to leave it to another.

LECTURES TO FARMERS' CLUBS.

Apart from the work of syndicate inspection done this year, the larger part of my lecturing work was for farmers' clubs, of which I have visited forty. I will divide the report of that work into three parts, as it assumes three different phases.

First, I was instructed by the department last fall, at the request of the Horticultural Society of L'Islet county, to deliver a series of lectures on the forestry question, and I delivered those lectures in seventeen localities, as follows:—

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| Counties. | Localities. | Counties. | Localities. |
|----------------------|--------------|---------------------|------------------------|
| Bellechasse. | St. Charles. | L'Islet | St. Jean Port Joli. |
| | St. Damien. | | St. Roch des Aulnaies. |
| | St. Gervais. | | Ste. Louise. |
| | St. Lazare. | Montmagny | Cap St. Ignace. |
| | St. Raphaël. | | St. François. |
| L'Islet. | L'Islet. | | St. Pierre. |
| | St. Aubert. | | St. Euphémie. |
| | St. Cyrille. | Vaudreuil | Rigaud. |
| | St. Eugène. | | |

That series of lectures was organized by Mr. Auguste Dupuis, president of the Horticultural Society of L'Islet county, who sent the following circular to the parish priests of all the above-mentioned localities:—

VILLAGE DES AULNAIES,, 1908.

Reverend
Parish Priest,
.

DEAR SIR:—

The Horticultural Society of L'Islet county, being alarmed at the damage done to our forests by wholesale deforestation for the manufacture of pulp and by their devastation by fires, which occur almost every year in various localities of our province, has thought it in the public interest to obtain from the Honourable Mr. Fisher, federal Minister of Agriculture, the services of Mr. J. C. Chapais to deliver a series of lectures on deforestation, its bad effects and the way to prevent them.

I now beg leave to ask if you will announce next Sunday that such a lecture will be given in your parish on at 7 o'clock in the evening, and advise Mr. Chapais as to the place where the meeting will be held.

Believe me, sir,
Respectfully yours,

(Signed) AUGUSTE DUPUIS,
President, Horticultural Society of L'Islet County.

As to the results to be anticipated from those lectures, I quote here a short sentence from one of our daily newspapers: 'The sound of alarm spread by the lecture about untimely deforestation, has greatly moved the people, and the wholesale timber-cutting will now be strictly looked after, if we may judge from the firm determination of those who are interested in having the law obeyed.'

This series of lectures was delivered in November, except the lecture at Vaudreuil, which was given in January.

The second series of lectures to farmers' clubs was given in the following localities, most of them in the month of December:—

| Counties. | Localities. | Counties. | Localities. |
|----------------------|----------------------------|-----------------|--------------------|
| Kamouraska | St. Alexandre. | Wolfe | Ham Nord. |
| Montmagny. | Notre Dame du St. Rosaire. | | Ham Sud. |
| | St. Euphémie. | | Notre Dame de Ham. |
| Richmond | Asbestos. | | St. Adrien. |
| | Danville. | | St. Camille. |
| | St. Georges de Windsor. | | St. Fortunat. |
| | | | St. Julien. |
| | | | Wotton. |

The lecture given to these farmers' clubs was of a mixed character. It was divided into three parts, the first dealing with the importance and the description of a good system of rotation; the second with the necessity and the rules for a good selection of farm animals, and the third with the good derived from cow-testing associations and with the rules to be followed in organizing them. These are all old subjects already mentioned in previous reports.

The third series of lectures to farmers' clubs was given in March, following instructions received from the department, at the request of the Horticultural Society

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of Kamouraska county, which asked that I deliver lectures in all the parishes in Kamouraska county, in order to develop the progress of horticulture. In consequence of that request, I delivered twelve lectures in the following parishes in Kamouraska county:—

| | | |
|-----------------|--------------|---------------------------|
| Kamouraska. | St. André. | St. Pascal. |
| Mont Carmel. | St. Bruno. | St. Philippe. |
| Rivière Ouelle. | St. Pacôme. | St. Anne de la Pocatière. |
| St. Alexandre. | St. Germain. | St. Hélène. |

Before closing this part of my report, dealing with farmers' clubs, I beg leave to remark that I find those useful institutions established almost everywhere now. Of all the parishes visited this year in the province of Quebec, I found only one where there was no farmers' club.

I have distributed amongst the members of farmers' clubs eleven hundred copies of bulletin No. 21 of our branch, on records of cow-testing associations.

VISITS TO COLLEGES AND SCHOOLS.

In the summary I have written in the present report, of one of my lectures, entitled 'Agriculture as a Career for our Young Men,' I mention the fact that I have often been asked to deliver lectures in schools and colleges on various topics connected with agriculture. Seven of my lectures this year were given in such institutions, viz.: at Ste. Anne de la Pocatière College, Kamouraska county; at L'Islet College, L'Islet county; at St. François Convent, Montmagny county; and at La Trappe or Oka Agricultural Institute, Two Mountains county.

The lectures given in those establishments were on: 'Agriculture as a Career for Young Men,' 'Domestic Science,' 'Forestry,' and 'Horticulture.'

FACTORY SYNDICATE INSPECTION.

From May 23rd to July 19th, I visited and inspected 76 cheese factories comprising three syndicates in the counties of Joliette, Berthier, Nicolet, Lotbinière, Kamouraska and Temiscouata.

I made 78 visits and met 196 cheese and buttermakers, 5,775 factory patrons and members of their families, delivered 154 lectures and travelled 1,316 miles.

The following table shows the number of districts, factories and patrons in each syndicate and the pounds of milk received daily at the time of my visit.

| Counties. | Parishes. | Factories. | Patrons. | Lbs. Milk. |
|-----------|-----------|------------|----------|------------|
| 2 | 10 | 23 | 907 | 75,210 |
| 2 | 9 | 24 | 988 | 105,458 |
| 2 | 16 | 24 | 1,449 | 136,940 |
| 6 | 35 | 76 | 3,344 | 317,608 |

I did this work at the request of the inspectors of these syndicates. The programme which was carried out each day was as follows:—

Every morning I received the milk at the factory myself, making a close inspection of the can and milk of every patron, and taking samples of all suspected milk for further examination. After the reception of the milk I made with the inspector a thorough inspection of the factory and of the butter and cheese found in it. I then proceeded to deliver a lecture of an hour on 'The Care of Milk and Milk Cans' and another of half an hour on 'Hog Raising for Bacon' and 'The Care of Milch Cows.'

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Before leaving, I suggested to the maker any improvements I thought necessary from my inspection of his factory and goods.

In the afternoon and evening the same programme was carried out with the exception of receiving the milk, making three factories visited, and six lectures delivered each day to the patrons and their families who were invited to attend.

At the end of the inspection of each syndicate, I had a special meeting on the evening of the last day to get together the proprietors of the factories and all the cheese and butter makers.

At these special meetings, addresses were given by the general inspectors of the syndicates and myself, touching the important points we observed, relating to the defects found in the cheese and butter and also in the factories.

The following is a summary of the points discussed:—

1. Butter.—Unsalted butter should never be made unless it be of the very best quality.

2. It is a mistake to deliberately incorporate too much moisture in butter so as to get more weight.

3. Cheese.—Green cheese should never be sold so as to secure more weight.

4. Soft and open cheese should never be deliberately made so as to get more yield.

5. Payment for milk for cheesemaking should be done on the basis of its fat content, as it is for buttermaking.

6. Cold Storage.—No cool or cold room should contain any other substance than dairy products.

7. Humidity.—There is often too much of it in factories.

8. Milk.—Bad milk should never be received in a factory on account of the fact that if it is refused, it would be received by the neighbouring factory.

9. At many factories it is delivered too late in the morning.

10. The maker should always receive the milk himself in order that he may know its quality.

11. Makers should never keep part of the money due to the patrons bringing bad milk to the factory, instead of refusing such milk.

12. Makers should have full control in regard to rejecting milk at the receiving stand and during its manufacture and should not allow any interference on the part of the factory owners about it.

13. Makers who use unfair methods to get milk from other makers' districts should never be engaged.

14. Makers should be able to give patrons the very best advice in regard to the proper care of milk.

15. Milk two days old should not, as a rule, be accepted in factories during the hot days of summer, except on Mondays.

16. Packing.—We should never find badly packed or boxed dairy products in any cheese or butter factory.

17. Pasteurization.—All poor milk should be pasteurized at the factory.

18. Whey would be of much better quality for animal feeding and would leave the cans which have contained it in much better condition if pasteurized.

19. The use of tobacco should be forbidden in all factories.

20. Uncleanliness.—It should never be found outside nor inside the factories, nor in the care of utensils, nor on the person of the makers in the factories.

21. Weighing.—Interference with the balance so as to get false weights of milk, in order to show a higher percentage of yield, or changing the figures when making out the patrons' accounts, is to be condemned very strongly.

22. Whey.—Never deliver whey to the patrons in close proximity to the weighing can during the reception of whole milk, as it is apt to be contaminated by the odour of the whey.

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I beg to say in conclusion, that most of the weak points mentioned above as having been found out in many factories and amongst the makers and patrons, would soon disappear, especially the poor quality of the milk received from the patrons, if we could close up one-third of the now existing factories which have no good reason for existence.

In fact, if we look at the figures given as the summing up of the number of factories visited and the number of pounds of milk received in each of them, we find an average of 4,179 pounds per factory. From the knowledge I have of the districts visited and of the inspected factories, I am sure that it would be possible to reduce the number of those by one-third, so as to have about 6,228 pounds of milk, and much better milk at that, as an average per factory. This becoming a fact, makers could refuse all bad milk without having the fear of seeing the patron carrying his refused milk to the nearby factory.

As most of those too numerous factories are unsanitary and poorly equipped, it seems that it would be possible to have them closed under the enforcement of the laws and regulations of the Provincial Bureau of Hygiene.

CONCLUSION.

I will close this report with the following remarks concerning especially my work as lecturer. I have been handicapped this year in doing that work, for three reasons. The first is that in May and October, 1908, we had to stop almost all work outside the office on account of the election campaigns that took place during those two months, one for the Quebec Legislature and the other for the House of Commons. Then, as already mentioned, I suffered in January and February, 1909, from the consequences of an accident which prevented me from doing much travelling during those two months. It is for those reasons that I did less work and had to do it under more pressing circumstances, for lack of time.

Another reason which has made my work more difficult is the fact that owing to special requests, I have been obliged to lecture on subjects which I have not generally treated in my previous experience as a dairy lecturer. This can be readily seen by a glance at the following list of the subjects of my lectures this year:—

- Agriculture as a Career for Our Young Men.
- Anguillule (Eel-worms).
- Care of Milk.
- Cow-Testing..
- Domestic Science.
- Duties of Factory Owners and Butter and Cheese Makers.
- Hand Separators.
- Hog-Raising for Bacon.
- Horticulture and Fruit Growing.
- Plantation of a Family Orchard in Eastern Quebec.
- Rotation and Selection.
- Rural Economy.
- The Forest and the Farmer
- Water in Connection with Dairying.

Hoping that this report will prove satisfactory, inasmuch as it shows that, notwithstanding adverse circumstances, I have done my best to advance our work for the public welfare.

I have the honour to be, sir,

Your obedient servant,

J. C. CHAPPAIS,
Assistant Dairy Commissioner.

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

FOR THE

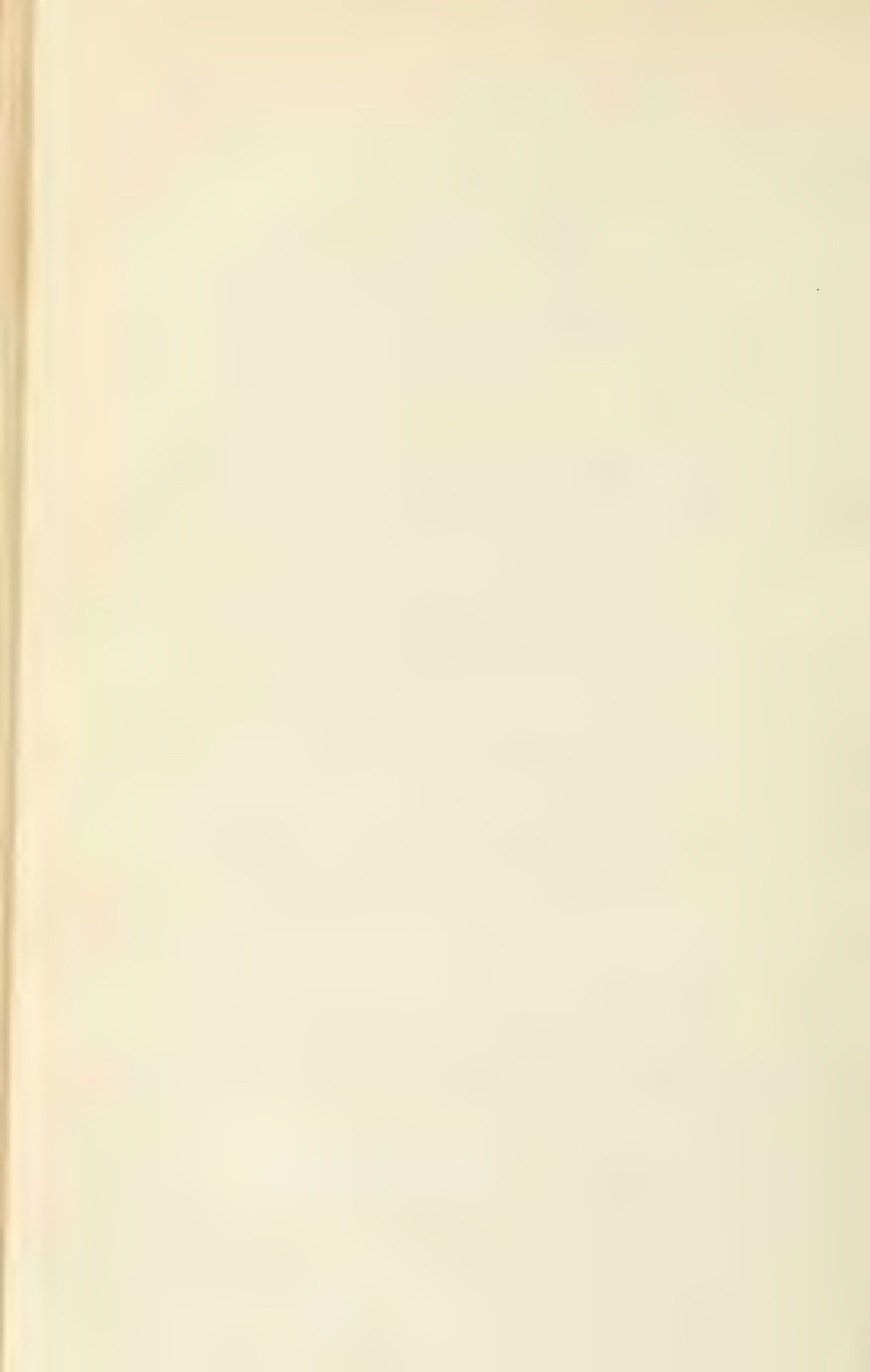
FISCAL YEAR ENDING MARCH 31

1909

PART III.—EXTENSION OF MARKETS DIVISION.

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Export Butter Trade—Export Cheese Trade—Export Apple Trade.*



PART III.—EXTENSION OF MARKETS DIVISION.

OTTAWA, March 31, 1909.

J. A. RUDDICK, Esq.,
Dairy and Cold Storage Commissioner,
Ottawa.

SIR,—I beg to submit a report of the work done by the Extension of Markets Division of the Dairy and Cold Storage Branch for the year ending March 31, 1909.

As is now generally known, this division has assigned to it the supervision of the work that the branch is doing for the improvement of the transportation facilities for the export trade in food products. To this end a system of inspection has been established to ensure as far as possible that perishable produce shall be carried at proper temperatures, that it shall be carefully handled at all times, and that delays in transit may be reduced to a minimum. This division also furnishes Canadian exporters with information relating to outside markets and brings foreign buyers into direct communication with shippers on this side.

CARGO INSPECTION.

INSPECTORS IN CANADA.

During the season from May to November, the following inspectors were employed:—

Six cargo inspectors at Montreal, who watched the handling of perishable freight as it was unloaded from the cars and loaded into the steamships, tested the temperatures of the butter before it was placed in the cold storage chambers on the ships, and placed thermographs in the different chambers and holds.

Three iced car inspectors at Montreal who reported the condition of the refrigerator cars which arrived at the railway terminals with butter, took temperatures of the butter and saw that it was carefully handled and quickly distributed.

Three travelling inspectors who looked after the iced cars in the provinces of Ontario and Quebec, tested the temperature of the butter at the various shipping stations and investigated any complaints regarding the service.

During the winter months one of the Montreal cargo inspectors was transferred to the port of Halifax to supervise the loading of apples and to install thermographs in the fruit-carrying steamers.

INSPECTORS IN GREAT BRITAIN.

In Great Britain five cargo inspectors were employed the year round, as usual, to look after the discharge of Canadian perishable products at the ports of Liverpool, Manchester, London, Bristol and Glasgow. These inspectors furnished complete reports respecting the condition in which each cargo was landed, removed the thermograph records and also interviewed, from time to time, the importers of cheese, butter, fruit, &c., on matters affecting the trade in these products.

CHEESE AND BUTTER EX. RIVER BOATS.

During the past two seasons we have paid considerable attention to the condition of cheese and butter ex. river boats at Montreal. In 1908 the deliveries of butter by

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canal and river boats amounted to 21,641 packages, and of cheese 346,378 boxes. As a rule transport by water is cooler than by land, but in many of these river craft it is the practice, when a large freight is carried, to stow both butter and cheese in the gangways on each side of the boiler, which as a usual thing is not inclosed, and throws off a great heat. A cargo inspector was detailed to look after the dairy produce brought in by these boats and when he found heated goods due to stowage in proximity to the boiler, he at once reported the facts to this office, and the owner of the boat was promptly communicated with.

The following circular was also sent to all owners and captains of river boats engaged in this traffic:—

DEPARTMENT OF AGRICULTURE,
DAIRY AND COLD STORAGE COMMISSIONER'S BRANCH,
EXTENSION OF MARKETS DIVISION,
OTTAWA, June 8, 1908.

To Owners and Captains of River Boats.

'For a number of years this branch of the Department of Agriculture has been working for better transportation facilities for perishable produce, both on the railways in Canada and on the ocean-going steamships engaged in the Canadian trade. During the season of navigation inspectors are employed at Montreal in order that the special iced car services for butter, cheese and fruit may be kept under constant supervision and that the loading of perishable produce in the ships may be watched and rough handling checked. This inspection work has now been carried on under the direction of this branch for several years with excellent results.'

'As you know, a considerable proportion of the cheese, butter and eggs received in Montreal during the season of navigation is carried by river boats. If care is taken to stow these products properly and to load and unload them carefully, there is no reason why they should not be delivered in first class condition. During warm weather, however, our inspectors at Montreal frequently report the arrival of heated butter and cheese ex river boats, caused, in almost every case, by stowage close to the boiler and engine room. (Even cheese is injured if the temperature goes above 60 degrees).'

'Under no circumstances should butter, cheese or eggs be stowed in proximity to the boiler, engine or cooking range. On the contrary, the managers of the companies concerned and the captains of the individual boats engaged in this trade should make it their business to see that on every trip dairy produce and eggs are carried in the coolest parts of the boat.'

'If river boat owners wish to hold this traffic they will be obliged to give more attention to this matter in future than they have in the past. Our progressive factorymen are now convinced of the importance of a cool curing room for cheese and proper cold storage for butter and, as a consequence, the majority of the factories in our best dairy districts are now well equipped in these two respects. The factorymen are now asking the transportation companies to do their part and the inland navigation companies running boats to Montreal will make a serious mistake if they treat this matter lightly and continue to carry perishable freight in a haphazard way without any regard for cool stowage or the condition of the goods on delivery at Montreal.'

'We therefore appeal to you to look into this matter at once and to give the officers of your boat, or boats, precise instructions regarding the proper stowage and the careful handling of butter, cheese and eggs.'

J. A. RUDDICK,
Dairy and Cold Storage Commissioner.

W. W. MOORE,
Chief, Markets Division.

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BENEFICIAL RESULTS OF CARGO INSPECTION.

It is now about seven years since this system of cargo inspection at ports in Canada and in Great Britain was inaugurated and in that time very considerable improvement has been brought about in the method of handling perishable freight, both in loading into the steamers and discharging therefrom. The presence of an inspector, who is constantly on the look-out to detect improper handling, has gradually effected a very considerable reform not only as regards the appliances used by the stevedores, but also as regards the actual handling of the packages by the men themselves. Cheese, for instance, are handled much more carefully than under the old conditions, and even with the much weaker box now in use it is unusual to see more than 10 per cent of breakage among boxes when unloaded at ports in Great Britain. This applies to shipments from Montreal only, as during the winter season, when Canadian cheese is shipped via the ports of St. John and Portland, the breakage is greatly increased, averaging from 25 to 45 per cent, including the boxes that are coopered by the steamship companies. At Portland, in particular, where cargo inspectors have never been employed, cheese, apples and other perishable goods are handled much more roughly than they are at the port of Montreal.

The presence of government cargo inspectors on the docks has been of especial benefit to fruit shippers, this being recognized not only by Canadian shippers but by United States shippers as well. Last season a member of one of the large fruit exporting firms located in Lockport, N.Y., paid a visit to the port of Montreal and after looking into the facilities there he stated that, in view of the system of cargo inspection in vogue and the fact that, through the placing of thermographs in the chambers and holds with the fruit, it was possible to obtain a record of the temperature throughout the voyage, their firm would in future route their export shipments via Montreal although the haul would be considerably longer than to their nearest United States port.

Last season the steamship facilities for the transportation of butter and cheese from the port of Montreal were exceedingly good. In September, I received a report from our London inspector to the effect that certain lots of cheese carried in No. 5 hold of the ss. *Cairnrona* had shown signs of heat when unloaded and I at once called the attention of the Montreal agents to this complaint, suggesting that the bulkhead which separates this hold from the engine room should be insulated. The Robert Reford Company, the agents in question, at once replied that they would look into the matter as soon as the steamer arrived and make such provision as would prevent further complaint of this nature. Later on our inspector reported that this bulkhead had been insulated with satisfactory results. In closing this reference to the improvement in transportation facilities I cannot do better than to quote a paragraph from a letter received by this office from Messrs. Frank R. Hamilton & Company, Liverpool, dated January 19, 1909, which reads as follows:—

‘On the whole the transportation conditions to-day are tremendously ahead of what they were some years ago and in consequence better results are obtained when the goods are sold on the British markets.’

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REPORTS OF CARGO INSPECTORS IN GREAT BRITAIN.

Following are the annual reports of the cargo inspectors employed under the direction of the Dairy and Cold Storage Commissioner's Branch at Liverpool, London, Bristol and Glasgow.

REPORT OF CHIEF CARGO INSPECTOR FOR GREAT BRITAIN.

(*Mr. A. W. Grindley.*)

LIVERPOOL, January 20, 1909.

I submit herewith my report as chief cargo inspector for Great Britain for the season of 1908.

The work of the cargo inspectors stationed at the ports of Liverpool, London, Bristol and Glasgow has been carried on in a most satisfactory manner. All Canadian perishable food products have been carefully watched, and detailed reports have been made on the printed forms furnished by the Department of Agriculture and regularly forwarded to you.

REPUTATION OF CANADIAN APPLES, SEASON 1908-9.

The cargo inspectors have reported on this season's pack; their reports, with numerous letters received from leading associations and members of the fruit trade in Great Britain, furnish a complete and reliable report on the reputation of Canadian apples, season 1908-9.

CHEESE.

There have been practically no complaints regarding heated cheese, but very numerous complaints regarding the great amount of shrinkage in weights this season, some receivers almost going as far as to charge that false weights have been marked on the boxes. No doubt the heavy shrinkage is largely due to cheese being shipped forward in too new a condition.

There have been a number of complaints of cheese being filled with old or inferior curd, thereby spoiling the sale as well as hurting the reputation of Canadian cheese.

There is still a large percentage of cheese boxes broken, principally among cheese from the province of Quebec. There is very little breakage among boxes from the best districts in Ontario, and Prince Edward Island boxes are also well made. The best carrying-box is the sewn type.

THE POULTRY TRADE.

Canada's poultry trade is now practically confined to shipping turkeys at Christmas time. No doubt the increase in the home demand accounts for the falling off in supplies sent to Great Britain, but I am sorry to have to report that the quality has also fallen off and that this season Canadian turkeys were shipped forward in the same slipshod manner as was found ten or twelve years ago, birds in full feather, and all weights and grades being packed together. Four and five years ago shipments of turkeys gave better satisfaction than they do to-day.

BUTTER AND MARGARINE ACT.

'The Butter and Margarine Act' came into force the first day of 1908, and after twelve months' experience the general opinion is that some improvements have been made in the butter trade, particularly as regards such frauds as milk blended butter, &c., where colonial butters carrying a low percentage of water were worked over and the percentage of water raised, not only to the limit of 16 per cent, but as high as 20 and 25 per cent.

Canadian butter shippers will be well advised to keep the percentage of water well below the maximum and also to be very careful regarding the use of preserva-

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tives, for although the British government have no standard fixed for quantity of preservatives in various foods, the local authorities and magistrates have convicted and fined many under section 3 and 6 of 'Sale of Food and Drugs Act, 1875.'

Attached please find annual reports from:—

Mr. Wm. Carter, Cargo Inspector for Ports of Liverpool and Manchester.

Mr. Thos. E. Davis, Cargo Inspector for Port of London.

Mr. Jas. A. Findlay, Cargo Inspector for Port of Glasgow.

Captain H. E. Shallis, Cargo Inspector for Port of Bristol.

To each of the above reports you will find attached letters from leading merchants in the fruit and provision trades, which are valuable reports in themselves. I take this opportunity of thanking the members of the Fruit and provision trades in Great Britain, and also the officials belonging to the different shipping companies in the Canadian service, for the courtesy extended to the representatives in Great Britain of the Canadian Department of Agriculture.

REPORT OF LIVERPOOL AND MANCHESTER CARGO INSPECTOR.

(*Mr. W. Carter.*)

LIVERPOOL, January 18, 1909.

I beg to submit the following report for the year ending December 31, 1908.

Shipments of Canadian agricultural produce have been very light to this port compared with other seasons, more particularly in butter and apples. I am pleased to note two practically new commodities, which are both of interest to the Department of Agriculture, arriving from Canada, viz., a lot of cases of frozen meats (livers, tongues, &c.), and a few lots of Canadian globe onions.

Personally I believe there are great possibilities for both these articles in this country. The United States does an enormous trade with this country in that class of meats, while the onions realized very good prices.

The following is a detailed account of the condition, &c., of the various food stuffs in which the Department is interested.

CHEESE.

With the exception of two or three shipments of cheese that arrived early in September, there has been very little cause for complaint re heated cheese during the past summer. The cheese from these steamers arriving early in September were badly heated, but this, I believe, was caused through the vessels being delayed in the St. Lawrence during very warm weather by the smoke from forest fires.

I am sorry to say there is very little improvement in the condition of the boxes. There is still a large percentage of boxes landing here more or less broken, and this is due in most cases to the poor quality of the box. Many of the boxes are made of poor, brittle wood, and it takes very little to break them. I have seen very few of the patent stitched boxes this season. These invariably land in good order, and are almost an ideal box for packing cheese. There is a slight improvement in the branding of cheese, there being fewer boxes arriving with the brand badly blurred. I am still of the opinion that all boxes should have the factory mark branded on them.

BUTTER.

There was very little butter arrived here last season. All that came was in good order. The boxes were sound and I did not see any cases of mould. More than half of them had no canvas covers, and this is a great mistake, for all butter should be sacked. Butter was carried at satisfactory temperatures and some splendid thermograph records were taken from instruments placed with it. The butter was cleared from the quay in good time, except in the case of one or two lots.

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EGGS.

Very few eggs arrived here during last season, but all landed in good order and condition.

BACON.

Shipments of bacon were fully up to the average, and all landed here in satisfactory condition.

APPLES.

There has been a tremendous falling off in the shipments of Canadian (Ontario) apples, but Nova Scotians were up to the average. With the exception of a few of the earliest shipments that were badly heated, apples have landed here in good condition. The damage done to the early shipments was caused by the vessels being delayed through smoke from the forest fires. With regard to the quality there has been a decided improvement on last season, particularly in 'Canadians.' These have been more honestly packed and branded, and I have heard very few complaints *re* overgrading of apples.

Except for the early arrivals above-mentioned, apples have been very free from spot this season, and I think we are having less spotted apples every season, for there has been a steady improvement in this respect for the last few years.

There has been little cause for complaint *re* poor or frail barrels, and I think shippers fully realize the advantage of a good, stout barrel over a cheap, common one. The one greatly helps the apples to land here sound and tight, the other tends to land them slack or worse.

With regard to Nova Scotian apples, there has been a good average quantity landed here, and they have realized excellent prices. They have been in excellent order and condition, being sound and very clean, but the bulk of them have been small, particularly the No. 2's. There is a general opinion among Liverpool fruit buyers that Scotian packers do not pack enough No. 3's in comparison with their No. 1's and No. 2's. Most varieties of Scotian apples are slightly smaller than Canadians and buyers here say that packers should not call their *best* apples No. 1's if they are only No. 2 size.

Both Canadian and Nova Scotian apples have been very free from frost so far this season. I have only seen one or two lots that were touched and these only slightly.

There has been but a slight increase in the arrivals of box apples, and these did not do very well. They were for the most part badly packed and were only of fair quality. In some cases the top layer of apples was properly packed and the rest simply poured into the box, and very few of them were papered. Our market can do with any quantity of good box apples, but they must be of the best quality, papered, and properly packed in a good case of uniform size.

COLD STORAGE OF APPLES.

Re apples coming in refrigerators, opinions differ greatly among Liverpool buyers, many of them say that the early tender varieties should be carried in cold storage, while others say that cooled air is best. Many buyers say that tender apples that have been carried in a refrigerator never stand long after being taken out, more particularly if the weather be warm. My own personal opinion is that apples carry best at a temperature of 38 to 40 degrees.

POULTRY.

Practically all the poultry that arrived here were the usual Christmas consignments, and these were in good condition, although many of the cases were rather frail.

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STEAMSHIP COMPANIES AND OFFICIALS.

All the steamship companies are doing their best to further the interests of Canadian shippers of agricultural produce in every way. The Manchester Liners, Ltd., commenced an improved weekly service from Montreal in September last practically for the apple trade, and, as you are doubtless aware, the White Star line are placing two new, fast, up-to-date steamers on the Montreal service in the coming spring. I think before very long we shall have nothing but first-class steamers, fitted with all modern appliances for carrying cargoes in the best possible manner, running between here and Montreal.

I here wish to state that I have received every courtesy and assistance from all dock officials of the various shipping companies.

Attached please find letters from Liverpool and Manchester importers.

Copy of letter from Bamford Bros., Liverpool, dated January 13, 1909.

'We are in receipt of your inquiry of the 7th instant, *re* the condition of the Canadian cheese which we have received during the past season as compared with previous seasons. We are pleased to say that during the past season we have received very few cheese in a heated condition. We also find that the boxes are landed here in a better condition than what they were a few years ago, the only exception to this being the cheese from the Quebec section. The boxes of these goods as a rule are more broken than cheese consigned from further west.'

Copy of letter from Co-operative Wholesale Society, Limited, Manchester, dated January 8, 1909.

'For some years we have with pleasure found a gradual improvement in the condition of cheese on arrival in Liverpool, which can, I take it, be ascribed to the improved means of transport, both rail and steamer service. We have practically had no cause for complaint, especially during the last two or three years.'

'With respect to the manufacture of cheese, we are of opinion that if less moisture was left in, much trouble would be obviated and loss in weight, a very important item; our losses through shrinkage or loss through exudation of moisture has at times been considerable.'

Copy of letter from George Little, Limited, Manchester, dated January 20, 1909.

'Replying to your favour of the 7th we are pleased to say that very few cheese, if any, arrived in a heated condition during the past season, and as regards the percentage of ten years ago, we are unable to give you any exact data on this question. We have not carefully retained statistics bearing on this point, but we have no hesitation in saying that not more than 1 per cent of the cheese exported to us have arrived in what may be termed a heated condition.'

'With regard to any suggested improvements, we do not know that the style of package of Canadian cheese can be improved. We have a fancy for, and our customers seem to like them, the larger weights of cheese running say to eighty pounds. We had some this year over, that figured round 100 to 104 pounds per cheese, and needless to say they look very imposing and command a good price. We have considerable difficulty in getting what is termed 'brickred cheese' suitable for the Midlands and Leicester districts. The factories seem indisposed to make cheese of this colour.'

'We formerly did a large trade in Canadian eggs, but this branch of the trade seems to have dropped out. We get no offers whatever, and the trade seems to be in too few hands.'

Copy of letter from J. J. Lonsdale & Company, Limited, Liverpool, dated January 11, 1909.

'In reply to your circular, it is impossible for us to say how much per cent the condition of Canadian cheese has improved, but this improvement is very consider-

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able and we have no complaint to make on that score, but we regret to say that the weights of cheese have been most unsatisfactory this season; not only the average loss, which has much exceeded any year in our experience, but also the box weights, or weight marked on the box, which we have found, not in one case but in a great many cases, much in excess, frequently by ten pounds, of the actual weight of the cheese. This is a very serious matter and we hope something will be done to put a stop to it or it will do a very serious injury to the Canadian cheese trade.

'We have also found some lots of cheese 'filled' i.e., the centre filled with curd and stuff. (Stuffed cheese shipped early in season, W.W.M.) We refer you to James Alexander, Montreal, our agent, for further particulars.'

Copy of letter from Mark Revill, Liverpool, dated January 19, 1909.

'Re the packing of 'Canadian' and Nova Scotian apples.

'I think this year has been an improvement on last, but I must say that the proportion of No. 2 fruit packed is still too small. In my opinion on an average season there should only be about one half packed as No. 1's, but my experience is that fully two-thirds are made No. 1's; this means a quantity of No. 2 fruit packed in the centre of the barrel. I always maintain no packer loses by keeping the fruit well up to the standard.'

Copy of letter from C. Townsend, Liverpool, dated January 19, 1909.

'Respecting the packing and grading of 'Canadian' and Nova Scotian apples. I am pleased to report that I have found a distinct improvement this season as compared with last. This branch of my business has consequently been more satisfactory both to myself and to my customers, from whom I have had fewer complaints than hitherto.'

Copy of letter from J. Johnston, Liverpool, dated January 19, 1909.

'Respecting the packing and grading of 'Canadian' and Nova Scotian apples, there has certainly been a marked improvement this season as compared with last, especially in Canadians, and I may state that I have had fewer complaints.

'There is one thing I may suggest with regard to Nova Scotians; they are a little small in the centre of the barrel.'

Copy of letter from Alfred Graham, Liverpool, dated January 16, 1909.

'There has been a great improvement in the grading of Canadian apples this season as compared with last season. Also Scotias show a greater percentage of packers who are reliable in their grading, and the use of flat hoops instead of round by some packers gives the barrels a more attractive appearance on the market.

'Maine apples never were worse graded than this season, as many of them after the first or second tier is displaced are filled in with apples both inferior as to size and quality.'

Copy of letter from Glover, Hill & Co., Liverpool, dated January 19, 1909.

'In answer to your inquiry respecting the packing of "Canadian" and Nova Scotian apples this season as compared with previous years.

'We should say that in the Canadians we have not found much improvement. There are still some packers who draw the lines very close as to what constitutes a No. 1 and a No. 2.

'Scotians, we are pleased to note, have shown a great improvement in their No. 1's, no doubt due to the crop being of a larger size, yet there are one or two packers who mix them, also top their goods.'

'The No. 2's are still a long way behind the standard they should be. A fact that goes to prove this is the small percentage of No. 3's which they take out of them.'

Copy of letter from Bellis & Meek, Liverpool, dated January 20, 1909.

'In response to your inquiry, we have pleasure in stating that in our opinion Canadian and Nova Scotian apples this season have shown a decided improvement



The ladies of the Canadian Pavilion, Franco-British Exhibition, 1908.



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in grading and packing as compared with the previous season. The No. 1's have been more reliable, and consequently on opening a barrel of this grade we could nearly always depend on getting No. 1 fruit, and therefore we have been able to buy with more confidence, whilst last year one was never surprised to find second or even third grade fruit branded as No. 1.

'With reference to Nova Scotian apples, of course the size generally has been small, but undoubtedly also the grading has been better. We consider, however, that a bigger proportion of the apples should have been marked No. 2.

'This season, we are glad to say, we have had very few complaints from our town and country customers, whilst last year we had almost daily complaints and demands for allowances, and this in spite of sending reliable men to the dock to report on the apples before we bought them.'

Copy of letter from Frank Hamilton & Co., Liverpool, dated January 19, 1909.

'In reply to your letter of the 7th instant, regarding our views on the work of the Canadian Fruit Marks Act, also on improvements instituted in the transportation and shipment of fruit from Canada during the last ten years, we have pleasure in placing at your disposal our experience on both these questions.

'Taking transportation first, there can be no question whatever but that improvements in this direction have been greatly to the advantage of all shippers of perishable goods.

'As you are no doubt aware, our firm has been for over twenty years personally represented in the port of Montreal during the shipping season, and we are therefore in a position to appreciate to the full the efforts your government have made to minimize the losses to shippers, caused by neglect and delay at the ports of shipment. It is not so very many years ago that a walk along the docks of Montreal would disclose thousands of barrels of apples piled in the open and exposed to the effects of the weather, both hot and cold, and with only the protection of a tarpaulin, if that, and the bottom tiers often covered with mud or coal dust.

'The steamers in those days only carried some 5,000 to 10,000 barrels of apples apiece, and the shutting out of goods was the rule rather than the exception. It was no uncommon thing to have a through bill of lading in our Liverpool office a month before the goods put in an appearance. Such a state of things is now impossible, Montreal being equipped with some splendid cargo sheds which will compare favourably with those of any port in the world, and as the railway tracks run alongside, the handling of goods is reduced to a minimum. In conjunction with those improvements, the class of steamer using the port is also improved, and it is seldom that perishable goods are shut out.

'Most steamers are now equipped with refrigerating plant, but so far as apples are concerned this is not taken advantage of so much as it should be, owing to the high rate of additional freight demanded, viz., 1s. per barrel extra for cool air, or 1s. 6d. per barrel extra for cold storage, say 2s. 6d. to 2s. 9d. per barrel, makes the total too high for the value of the goods. The consequence is that, except in cases of very soft summer apples, the shippers prefer to risk the ordinary storage.

'The recent concession of your government to fruit shippers of free icing of cars during transit has had a beneficial effect on the condition of the fruit arriving at port of export.

'On the whole, the transportation conditions to-day are tremendously ahead of what they were some years ago, and in consequence better results are obtained when the goods are sold on the British markets.'

Copy of letter from J. C. Houghton & Co., Liverpool, dated January 9, 1909.

'We duly received your favour of the 7th instant, and we need hardly say that any information we can give you on the points you raise is heartily at your service.

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'As regards the grading and packing of Canadian apples, we regret that the irregularities so noticeable in previous seasons were again present in this one. We cannot but think that the government inspection at shipping points has had some good effect, but the fact remains that we have still the anomaly of seeing a No. 2 grade of one shipper bringing as much or nearly as much as a No. 1 of another. It does not seem logical or right that prices of one grade of apples should have a range of several shillings, though we confess we do not know how shippers are to be forced to observe a more uniform standard of quality, whether it be for No. 1 or No. 2 grades.

'As regards condition, it is only too well known that many of the earlier shipments of Canadian apples this season gave *disastrous* results, mainly in consequence of the wasty state in which they landed here. We believe that intensely hot weather just before and about the time of shipment was largely responsible for this, but we also understand that previous atmospheric conditions were such as to cause apples to mature earlier than usual, and to leave them with less carrying and keeping power.'

'As regards transportation improvements on the other side, we are not in a position to speak, but it does not appear to us that of late years there has been any marked general improvement in the condition in which Canadian apples are delivered in this country.'

REPORT OF THE LONDON CARGO INSPECTOR.

(*Mr. Thomas E. Davis.*)

LONDON, January 16, 1909

I beg to submit herewith report on the local work of the branch for the year ending January 15, 1909.

NEW STEAMERS IN THE LONDON SERVICE.

During the year under review several additions have been made in respect to the London service.

The Thomson Line.

The s.s. *Cairnrona* (twin screw) is the latest addition to the Thomson line. This steamer has facilities for the carriage of cheese, butter, bacon and eggs, and has a capacity of 81,000 cubic feet for cooled air, and 20,000 cubic feet of refrigerator space.

In connection with the ordinary stowage of this vessel, I had occasion in July last to report on the condition of certain cheese found to be heated, the result of being stowed close to a warm bulkhead adjoining the engine room. Following representations from Ottawa, the bulkhead in question was insulated with satisfactory results.

At the commencement of the Montreal season the *Latona* of this line, with freight for London, foundered through a collision during foggy weather.

Allan Line.

The ss. *Corinthian*, with a total cold storage capacity of 10,162 cubic feet, and the s.s. *Sicilian* with 14,700 cubic feet of refrigerating space are other additions to the London service

The Canadian Pacific Railway Line.

These steamers berth at Millwall docks and lighter perishables to the Surrey commercial docks for warehousing in cool air.

TURNLESS, WITBY LINE—NOVA SCOTIA AND LONDON.

The steamships *Tabasco* and *Almeriana* are extra fruit carrying vessels, being well ventilated. In the case of the *Tabasco*, she is fitted with machinery for forcing cool air through holds, with similar means for the extraction of hot air.

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The facilities for landing, warehousing to marks, and forwarding apples and cheese, continue to be all that can be desired.

THERMOGRAPHS.

The confidence in the accuracy of these instruments is not misplaced. During the Montreal season I repeatedly checked them with a registered Kew Observatory thermometer, and in every instance the readings have been more or less identical.

INQUIRIES.

During the year my duties involved the supervision of produce ex. steamers, taking temperatures, and noting the condition of goods and packages prior to delivery from wharf, watching the loading and unloading at depots and subsequently following the goods to the receivers as far as practicable and within a reasonable area. In this respect I made about 1,300 calls on matters dealing directly with the products, as set out in my separate reports on each inward steamship. I also made a special point of keeping in touch with the department's consignments for the Franco-British, Horticultural, Crystal Palace and Grocers' Exhibitions.

HEATED CHEESE.

From examination of cheese made during the landing from steamers, the improvements made continue to be manifested by good results. As in the case of the *Cairnrona* already mentioned, the adverse conditions were speedily remedied.

MIXED CHEESE.

Three instances of mixed cheese have been brought to my notice during the past season, particulars of which were duly reported.

BUTTER.

There has been a decided falling off of butter shipments during the Montreal season, and a noticeable absence of box wrappers. There were no complaints in respect to mould, the temperature during ocean transit and dock storage being very satisfactory.

'CANADIAN' APPLES.

The few that have come forward have invariably gone to the provinces, but those retailed here have been of good quality, well packed, and have given general satisfaction.

NOVA SCOTIAN APPLES.

From personal observation at the docks and my subsequent visits to warehouses, conjoined with the letters before me from leading importers, I have no doubt whatever that the apples of this season have surpassed in quality those of last fall.

Geo. Munro, Ltd., writes:—

'We receive a good many apples from Nova Scotia. The N.S. have certainly been packed much better than hitherto, and the crop having ripened much better than usual, we found them on the whole above the average sample.'

The foregoing opinion is voiced by all the leading London merchants whose letters are attached.

COLD STORAGE FOR EARLY APPLES.

The merchants are somewhat divided in respect to the success of this venture. Garcia Jacobs & Co., writing from a financial point, say:—

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'We do not think early apples are likely to bring satisfactory prices when sent in refrigeration, as in the month of August, when Canadian apples are ready, there is a large quantity of continental apples sent from the south of Europe.

'The only good result that we have ever known for early apples under refrigeration has been when the English and continental season was backward, and then the early apples from the eastern states of America met a good market.'

J. O. Sims says:—

'Pears and early apples in cool air would be all right if the market here were free from home and continental grown fruit.'

J. B. Thomas writes:—

'The first arrivals of Gravensteins were very unsatisfactory, the apples having been picked rather green and shipped in such hot weather. The condition of these Gravensteins would have been much improved had they been shipped in cool chambers, as all apples sent forward in warm autumn weather should be.

'As to pears, the only successful method of handling these is to cold store them immediately they are picked, and repack for shipment in refrigeration as soon as they are cooled down, a method which would also apply to peaches, so long as they were not subject to a temperature of less than 38 degrees.'

LONDON APPLE MARKET.

During November last much indignation arose amongst the London buyers as a result of the action of certain of the Covent Garden brokers who commenced the practice of deliberately erasing from sample barrels, brought up for auction, the names of the growers. However, as I have already reported the matter, it is only fair to add that my representations to the parties concerned have produced the desired effect, and this objectionable practice has now been abandoned.

For many seasons past the prices recorded on this market have fluctuated very considerably owing to alternate over-feeding and starving in the matter of supplies. When apples are sent forward in continuous large quantities for some weeks, the auction brokers, possibly somewhat enervated by continuous pressure from buyers, show a disposition to clear their stock at all hazards, and an inevitable slump ensues. This naturally has a reflex action on the wholesale market and drastic measures are then necessary in order to stiffen prices. These take the form of practically cutting the supplies down to a minimum, as occurred during the recent Christmas season, when prices rose very quickly to an almost prohibitive figure, with the result that the public turn their attention to other and cheaper classes of fruit, so that it is a long time before the market is again able to absorb large quantities. Clearly, if the public will not pay the enhanced price demanded by the retailer, the latter cannot afford to risk his money in the auction sales.

Under the conditions above outlined, it will readily be seen that the greatest sufferer is not so much the commission man on the other side, as the farmer who has grown and shipped the apples, anticipating a fair return on his outlay.

Making due allowance for the obvious necessity of sending certain soft varieties of fruit to market as rapidly as possible, I am of the opinion that greater co-operation is desirable between shippers and brokers, who appear to me to have a mutual interest in maintaining a steady market. If developed on the right lines, such co-operation would exercise a proper control on supply and demand and even when, for various reasons, shipment in large volume is unavoidable, steps could be taken to find fresh outlets at the outlying ports and provincial towns easily served from London, thus opening up a wider field for distribution. When fine eating apples of top grade are knocked down at anything between 9s. and 12s. 6d. per barrel, it is obvious that a needless sacrifice is being made, and I should recommend that reliable agents in provincial towns and ports within reach of London be given an opportunity of absorbing the excess

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fruit which frequently, under present conditions, only serves to glut the London market.

Acknowledgments.—I wish to record my appreciation for the courtesy always shown me by Mr. W. L. Griffith, of the High Commissioner's Office, and the dock and shipping companies who have been ever ready to assist me with any information dealing with the work of this department.

Please find attached original letters from merchants referred to.

Copy of letter from The Co-operative Wholesale Society, London, dated January 7, 1909.

'In reply to your letter and inquiry sent on behalf of the Dairy and Cold Storage Commissioner at Ottawa, dated January 2nd, permit me to say that for the past few years we have with pleasure noted a gradual improvement in the condition on arrival at both Liverpool and London of Canadian cheese, which I do not doubt can be safely ascribed to the improved means of transit both by rail and boat. We have practically had no cause for complaint of the cheese being heated, more particularly during the last two or three years. Going back prior to this period, say ten years ago or before, we had frequent cause for complaint of heat in the cheese. This leads me to say, answering your second paragraph, that we think the improvements during the last decade in the matter of ocean carriage have brought about very good results.'

Copy of letter from Lovell & Christmas, Limited, London, dated January 4, 1909.

'In reply to yours of the 2nd instant, speaking from our personal experience the percentage of heated cheese throughout the past season has been practically nil. During the warm weather we brought all our cheese in cool storage, at a small additional freight, and found this precaution was of great advantage because, the cheese arrived here in perfect condition, and the saving in the weight (shrinkage) almost, if not quite, covered the extra expense incurred by having the cheese in cool instead of ordinary stowage.

'In our opinion, there has been a vast improvement in the carrying of cheese during the last ten years, and as far as the past season is concerned, we do not think it could well have been improved on. We believe this is the general feeling of the trade here, especially on the part of those who have taken advantage of the cool storage on the vessels.'

Copy of letter from Andrew Clement & Sons, Limited, London, dated January 6, 1909.

'In our opinion Canadian cheese have carried much better the last season or two than ten years ago, better attention having been given not only to the carrying, but also as regards the handling of the boxes at the other side and the discharging of same at this end.'

Copy of letter from Rowson, Hodgson & Company, Limited, London, dated January 7, 1909.

Heated Cheese.—Our experience is that only a limited quantity of the imports from Canada this season have shown any external or internal signs of heat. We would not think 5 per cent of the entire quantity received into the country, whereas ten years ago probably fully 25 per cent of the goods arriving suffered from the defect referred to.

'Regarding the ocean carriage and landing of butter and cheese, so far as London is concerned there has been a gradual improvement during the last fifteen years, and more especially since the time that the cool air stowage has been adopted on two lines of steamers, viz., the Thomson and the Allan lines.'

Copy of letter from Geo. Monro, Limited, London, dated January 4, 1909.

'We are in receipt of yours of the 2nd instant, and beg to say that we receive a good many apples from Nova Scotia but not much other Canadian stuff direct. The

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Nova Scotia apples have certainly been packed much better than hitherto so far as we are concerned, and the crop having ripened much better than usual, we found them on the whole above the average sample. We think it would certainly be advisable to try some of the earlier apples in cool storage, as there is very great risk in such as Gravensteins. If they happen to come during a mild week they scarcely ever arrive in good condition.'

Copy of letter from W. Dennis & Sons, Limited, London, dated January 13, 1909.

'In reply to your letter of the 2nd instant, we beg to state that shipments of 'Canadian' apples to London, so far this season, have been so remarkably small that we really do not feel justified in making any report upon the pack and condition of the season.

'As regards Nova Scotian fruit, we have very great pleasure in stating that, on the whole, the fruit itself has been of a very much better character than for some years past. There has been very little spot noticeable since the earlier arrivals of summer fruit, and, generally speaking, the size of the fruit has been bolder and arrivals have come to hand in fairly good shape.

'With respect to your Mr. Moore's inquiry about shipments of pears and early apples in cold storage, our experience this year has been to the effect that, as regards pears at any rate, cold storage transport in refrigeration is an absolute necessity. We have been in receipt of quite a few from Ontario and, in each case, owing to the ripening of the fruit under the rapid changes of temperature, the stock has arrived here in more or less rotten condition, and what would otherwise have sold at very remunerative figures had to be sacrificed at a very great loss to the shipper. We therefore have no hesitation whatever in recommending all this stock to come forward, as before stated, under refrigeration.'

REPORT OF GLASGOW CARGO INSPECTOR.

(*Mr. Jas. A. Findlay.*)

GLASGOW, January 24, 1909.

I have much pleasure in forwarding my annual report for season, 1908. Generally, imports of various Canadian produce to Glasgow show a decrease, due not to any falling off in quality or lack of confidence on the part of importers, but rather to the requirements of Canadians for an increased amount of their own products, and the prevailing dullness in all branches of trade in Glasgow, reducing the purchasing power of the consumers and shortening the demands of the public.

In most quarters satisfaction is expressed with the quality of the various Canadian products imported, and though now and again complaints occur over some consignments arriving out of condition or below the high standard usually shipped, yet, satisfaction exists in all branches at the efforts of the Department of Agriculture of Canada to maintain the highest standard of the Canadian product. I regret being unable to secure any definite percentage of heated cheese arriving this season as compared with ten years ago, but all importers declare pronounced progress exists in this respect in the present freedom from heat traces on cheese consignments.

I have endeavoured to convey in the following general report criticisms and suggestions expressed by consignees, and trust this report may be satisfactory.

CHEESE.

The Canadian cheese trade again shows a shrinkage in imports to Glasgow, the season's returns being over 20,000 boxes short of season 1906-7.

The season opened with a slow demand for Canadians, owing to the quantity of New Zealand produce on the market in the spring and early summer. Following this, the Scotch manufacture was a good average one throughout the season. This,

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coupled with the smaller consumption and the high price of Canadians, resulted in a smaller demand from Glasgow for Canadian cheese all season.

QUALITY AND CONDITION.

While the season's imports have been on a small scale, the quality and condition have been most satisfactory, and Canadians mark a distinct advance regarding condition of arrival and uniform excellence in quality throughout the season. Though a few parcels were weak in flavour, the general average shows improvement. The pronounced complaint of last season of makers shipping 'green' cheese was almost entirely absent this season, yet I saw a few parcels showing dangerously immature, and until shippers firmly stop this practice, which results in loss to importers (last season's errors committed by Canadians caused an increased demand for New Zealand cheese, which are rapidly rising in the market estimation here), the demand for Canadians will suffer.

Cheese, notwithstanding the hot weather in Canada and also in Scotland, landed throughout the season in excellent condition and remarkably free from heat.

One pleasant feature of this season is the marked change in opinion by importers when speaking of Canadian cheese. Last year they severely criticised, but this year the majority commend Canadian cheese for quality, and admit that between choice Canadian and Scotch manufacture there is little or no difference in quality. In this connection, I may say that I am credibly informed that choice Canadian are retailed by shop-keepers as 'best Scotch Cheddar.'

CHEESE BOXES.

The condition of the boxes showed improvement in some respects, but the percentage of damaged boxes was far too large, and frequent complaints on this score were made by receivers. Occasionally I have had to point out to the shipping companies the fact that a few individual workmen were handling the boxes roughly from time to time, but I always found them most anxious to impress on their employees the necessity for careful handling. In many cases of extraordinary breakages the cause lies in the irregular boxing of parcels, and I invariably find that a large percentage of broken boxes is due to defects in boxing, such as too large boxes, the sides of which I have seen extending above the cheese from 1 inch to 1½ inch, or else the boxes are too short and perhaps in addition much too wide. Another fault is that of boxing heavy cheese of 90 to 98 pounds weight with slim boxes. There is great room for improvement in the boxes over all, as, while many parcels are landed regularly well boxed and in sound order, yet others as regularly arrive showing from 25 per cent to 40 per cent damaged, and frequently a considerably higher percentage of breakages are apparent.

BUTTER.

Imports of Canadian butter were on a very small scale this year again owing to the fact that the ruling price in Canada was too high to permit of profitable importation. Small as the imports were in 1907, those of 1908 were less.

QUALITY AND CONDITION.

The quality of most of the butter was satisfactory, some indeed being very choice; unfortunately a few parcels showed mould on the parchment and another arrival decided mould on the butter; one or two parcels also arrived out of condition having developed a 'fishy' flavour. Needless to say these defects are undesirable and detrimental to the reputation of Canadian butter. Only about one-third of the shipments were sacked, but packages were landed in good order and exceedingly few cases of broken covers or damaged boxes were apparent. The steamship companies maintained a temperature of around 19 to 22 degrees on an average in refrigerators in transit.

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This season, with the exception of a few parcels, the bulk of shipments were lifted the day or second day after landing from refrigerators, about 450 boxes the third day after, 175 the fourth day after and 60 boxes the sixth day after. This is a slight improvement on last season's results.

EGGS.

The imports of eggs were small, being little more than a fourth of last season's totals, but those that came were of good size and condition and from all reports gave complete satisfaction to importers. The shipments were well boxed, landed in good condition and were handled with care.

BACON.

Canadian bacon again shows a slight decrease in imports to Glasgow over last season. The quality has been good and has given satisfaction generally and increased quantities could be taken here. One importer compared the keeping qualities of the Canadian bacon with the U. S. A. product and claimed that the former, in the event of having to be held up on account of unsuitable markets, depreciates in value in a week's time, whereas the latter can be relied on to stand up for two or three weeks without undue sign of depreciation. He is of the opinion that this may be due to the style of cure adopted in Canada as much as to its mildness.

A considerable number of barrels of buttocks and beef, also a few barrels of livers, were imported, a small lot of the latter being condemned by the sanitary inspector here. In view of the rigid inspection of 'boneless meat,' extreme care must be exercised by Canadian packers of this and all meats.

CANNED APPLES.

There is a considerable trade in canned apples to Glasgow, of whose requirements Canada supplies the bulk, but this year, in common with most other imports from Canada, a slight falling off is observable.

I find receivers well satisfied with consignments, and generally speaking the pack seems well handled, there being a very small percentage of blown or defective tins as a rule. This year receivers point out some defects which it might be advisable for canners to rectify, as presently Canadian canned apples, though supplying the bulk of the Glasgow market, only occupy second place in point of quality. A New York firm's product commands from 1s. to 2s. more per case and the general opinion is that Canadians compare unfavourably with this firm's brand. Some objections to Canadian canned apples are:—including defective fruit and including, in same pack and cook, hard and soft varieties, consequently tins open up uneven with hard and soft pieces together. Several such cases have been shown me at various periods, the tins opening up with brownish and clear coloured fruit together. It would be a decided advantage if canning factories would cook, as far as possible, varieties of one hardness and consistency together, and softer varieties separately, and it is felt here that if canners would state on the cans the varieties included in the cook it would enhance the value of the Canadian pack. Some importers state that cans opened flavourless and hard, and one objects to what he considers the undue proportion of juice in Canadian cans, there being generally about one pound out of tins weighing six and three-quarter pounds, whereas in the U. S. A. brand 'Curtis Brothers,' the cans are filled with apple and just sufficient juice to cover the fruit.

CANADIAN APPLES.

The apple season of 1908 has been of much smaller dimensions than 1907 owing to the shortness of the Canadian crop, and at the moment of writing parcels of good pack and condition secure very handsome prices. The season in its results was a somewhat varied one. For the first arrivals of summer fruit ex. refrigerator, which

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came to hand in good condition, prices were satisfactory and the quality promised well for a profitable season, but arrivals a few weeks later were landed in most unsatisfactory condition owing to the hot weather prevailing in Canada and through detention to shipping on the passage down the St. Lawrence; consequently the bulk of shipments via ordinary storage from September 23 to October 28 arrived heated, over-ripe and 'wasty,' with pronounced scab and mildew on Greenings, Snow, Holl and Fall Pippins and other tender-skinned apples, and also on other varieties which as a rule are not affected by scab or mildew. As a result apples arriving during this period, with a few exceptions, had to be sold with ruinous results, the bulk of these early shipments being disposed of to the hawker class of vendors, who retailed them through the streets at low prices. It is felt here that packers cannot in many cases have exercised sufficient supervision to keep out of the early pack fruit affected with scab, as large quantities of Greenings and Snows opened up completely covered with scab and mould, and when decay was apparent sold for 1s. 6 d. to 8s. or 9s. per barrel, shipments during this period containing frequently all shakes or slacks, or a very large percentage of such. Fortunately the winter fruit shipped later, arrived in excellent condition and, being of very fine quality, secured very high prices owing to the shortness of supply.

QUALITY OF APPLES.

The pack and grading of apples has on the whole been more in accordance with the Fruit Marks Act than last year's shipments, and certainly marks a decided improvement, though a few packers still require to be severely dealt with, one or two in particular this season persistently over-grading their apples. While the earlier shipments displayed a decided lack of colour, the most pronounced complaint this season has been the lack of keeping quality. This condition has been the means of loss to large holders. There was again a considerable quantity of boxes imported and here also early shipments suffered from heat and landed over-ripe. Boxes are becoming more popular in Glasgow. Several retailers on whom I have called state they prefer to deal exclusively in them in preference to barrels, as, though the cost is greater, the waste is much less, or practically nothing compared to that in barrels. Box fruit, however, is expected to be choice, and in comparison with Californian or British Columbian boxes, there is great room for improvement in the Ontario package, in grade and general style of pack.

NOVA SCOTIAN APPLES.

A noticeable feature this season has been the quantity of Nova Scotian apples imported to Glasgow, and though not so popular in Glasgow as the Ontarian varieties, this year they met with ready acceptance and secured remunerative prices owing to the scarcity of the Ontarian supply. All season the supplies from Nova Scotia have arrived in splendid condition, being clean skinned, of good colour, and generally regular in size, though quite a number of parcels of Baldwins and Greenings have been of poor grade, and the former somewhat lacking in colour. A special feature has been several choice parcels of Kings. In all there have been over 40,000 barrels imported this season from Nova Scotia as compared with scarcely 8,000 last season; these along with importations of western States apples have helped to relieve the scarcity in the market here. One feature which militates against the greater popularity of the Nova Scotian apples is the style of barrel; buyers generally, but especially those in the country districts, prefer the Ontario barrel, and the small Nova Scotian package is looked upon with disfavour. In a year of normal supply from Ontario, Nova Scotian apples would not have had such a good market, as they are considered here to be lacking in flavour and tending to be 'woody' in body.

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CANADIAN PACKED AMERICAN APPLES.

This year there has been a considerable quantity of western states apples put up by Canadian packers in the United States and graded according to the Canadian standard, shipped to Glasgow; in most cases the packers have adhered to the standard pretty closely, but one or two have not hesitated to put in their No. 1 grade apples of decidedly lower quality.

Apart from the grade value of the apples, it is felt in some circles here that the style of the brands are in most cases misleading and calculated to give a spurious value to these apples. I have kept you advised of the various styles of branding; and in all cases where it does not clearly state on the barrels 'product of U.S.A.,' certain dealers here consider that barrels lacking this are liable to be sold as Canadian. It is felt that the brand 'American Apples' is not sufficiently distinctive when the packer's name is that of a well-known Canadian packer, followed by the address in Canada and sometimes 'Canada' on the barrel, of which I give two examples, viz.:—

Northern York State Apples,
J. G. Dudley & Son,
S. G. Dudley,
Brighton, Ont., Canada.

or

American Apples,
G. W. Herrington,
Brighton, Ont., Canada.

The large wholesale buyers are perfectly aware, as a rule, that the apples are U.S.A. product, but the smaller buyers, shop-keepers, &c., who purchase from wholesale merchants, are not so enlightened and accept them as Canadian apples, which must indirectly adversely affect Canadian grown apples, and it is felt that in the interest of the Canadian apple trade some clearer style of branding is necessary.

PEARS.

There have been considerable shipments of Canadian pears this season to Glasgow with varying results; these, however, have been on the average satisfactory, as most of the shipments came in cold storage and with certain exceptions landed in fair or very fair condition.

QUALITY AND CONDITION.

The quality of Duchess, Anjou, Winter Nelis and Bartlett, which are the most popular in Glasgow, was very fair and when landed in good condition commanded satisfactory prices. This market could take increased quantities of these varieties of pears from Canada and if well and regularly packed, they will command remunerative prices, but it would be well in future shipments to pack the fruit greener than was done this season, as many consignments came to hand over-ripe and others heated and 'wasty,' the result being forced sales and lower prices. The early arrivals of Bartletts were generally slightly ripe, but many of the later arrivals of Duchess and Anjou came to hand in very fair condition. Towards the end of the Montreal season several shipments of cooking pears (Keiffers) arrived in boxes and barrels. The latter, carried in ordinary storage, were over-ripe and decayed, but the boxes ex refrigerators were generally in very fair order, though some parcels were rather ripe, necessitating a rapid sale and consequent low prices. The Keiffer is considered here a cooking pear only, and even as such is not largely used, as the people do not cook pears to any extent. In some quarters it is thought that the trade in Keiffer pears could be fostered were cooking instructions printed on a slip and packed along with the boxes for a time. I notice some packers of box fruit have adopted a similar method regard-

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ing Tolman Sweets. The Keiffer pears should also be shipped greener than they have been this season, as when they arrive ripe brokers require to get them sold quickly to escape decided decay and loss. According to the trade here Canadian pears are not as regular in grade as those from California, which are largely shipped here in cold storage and generally lead the market.

BOXES.

The favourite package is the half case for choice pears, as the fruit encounters less pressure than in the full cases and arrives in better condition.

Copy of letter from Herbertson & Hamilton, Glasgow, dated January 15, 1909.

'We have pleasure in reporting that our shipments of Canadian cheese received the past season show a distinct improvement both in condition and quality compared with previous years, and are a great advance in all respects in comparison with what we were receiving, say ten years ago. The quality of the various factories has been more regular and there has been a conspicuous absence of anything of a distinctly inferior character. The meat, texture, flavour and style all show an improvement, and it is evident the dairy instructors are making their mark on the quality of Canadian cheese. The only complaint we have to make, and it is a somewhat serious one, is of the newness of the cheese when received. Many of our lots seem to have been shipped almost immediately they had been made, so that we had to hold them over here for some time before they were fit for use, which resulted in a serious indrink and consequent loss.

'The boxes of our western shipments have arrived in fair condition but some lots of Quebec make were all broken and knocked about, which in some cases was explained by the boxes being too large for the cheese.

'We have also had some trouble with indistinct marking of weights on the boxes. There are still a few fossilized makers who continue to use lead pencil instead of stencils, and the result is vexation and loss to buyers here, as in such cases the figures are almost illegible and easily lead to mistakes.

'We suggest that it should be compulsory to have the weight clearly stencilled on every box, or failing this, that buyers in the factory districts should insist on one-eighth of a cent per pound of a reduction on cheese not so marked.

'We would again emphasize the advisability of having every cheese legibly dated when made, so that the trickery which has been indulged in by unscrupulous dealers should be effectively put a stop to. We consider this would be very greatly to the advantage of the factorymen, as at present early made cheese are cold stored and shipped as Junes, while July and hot weather cheese have in some cases to our knowledge been shipped out the end of September and represented as September goods. The result of this has been that buyers have had no satisfaction in using the cheese owing to their want of keeping properties, which has had the effect of damaging the reputation of the Canadian product, while the sole cause of the trouble was the untrue description given the cheese. We hope this matter will be firmly dealt with before the start of the new season.'

Copy of letter from James Leggat & Company, Glasgow, dated December 24, 1908.

'In reference to your call *re* quality and condition of Canadian cheese. Generally speaking the cheese have arrived in good condition notwithstanding the hot summer both here and in Canada. We have had little to complain of in regard to heated cheese and nothing at all in comparison with say ten years ago.

'Regarding flavour, there is still room for improvement, though this has also been improved during the past season. The long drives with milk over bad roads in hot weather may account partly for this, also objectionable weeds in the pasture at certain seasons, further, the milk cans are sometimes used for taking back whey to

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the farm and afterwards not properly cleaned. Any or all of these will produce a faulty flavour in the cheese.

‘Improved quality always commands a larger demand and a better price.’

Copy of letter from Fulton & Weir, Glasgow, dated January 11, 1909.

‘We consider that the quality of Canadian cheese has been very much improved these last ten years as regards texture, flavour and colour, and certainly as regards heating there is little or nothing to complain of now, whereas ten years ago it was a constant source of complaint.’

‘We consider that the Canadian cheese are coming very near the quality of our Scotch cheese now, and if they were only shipped in a more mature condition, they would be much more marketable when they arrive here. A very large proportion of the Canadian cheese which have arrived these last two or three years have been shipped far too green; indeed one is inclined to believe that they are being shipped as soon as they are made.’

Copy of letter from Andrew Clement & Sons, Ltd., Glasgow, dated January 19, 1909.

‘The Canadian dairy produce trade of 1908 has been a disappointment to Scottish importers, because of adverse markets and decreased supplies. It is somewhat disheartening to record another year of diminished trade, and should the shrinkage not be stopped we are afraid Canada will lose her present strong position in cheese, and what was at one time a rapidly improving position in butter. Fortunately the butter and cheese requirements of Scotland show no decline, but only that importers have been forced to fill their wants to a greater extent from other sources of supply.

‘At your request we sum up the position as follows:—

‘CHEESE.

‘*Condition.*—Heated cheese were too few to do any harm worth mentioning, and the present carrying arrangements are about as near perfect as we can reasonably expect.

‘*Quality* cannot be said to have shown much improvement, neither has it deteriorated.

‘*Appearances* leave still much room for betterment in neater edges to the cheese and particularly in better finished boxes. We notice a gradual deterioration in the style and strength of cheese boxes as compared with past years.

Weights have been more and more unsatisfactory and the shrinkage has caused heavy losses to importers. The practice of shipping too green cheese is doing great injury to the Canadian trade.

‘*Supplies.*—Owing to short make and high prices in Canada, Scotch importers find they can get better value in home and New Zealand cheese on which they have no loss in weight, consequently, their requirements for Canadians were smaller than formerly. The enormous increase in New Zealand supplies from January till June makes it unnecessary for importers to buy and carry from the autumn the heavy

‘(5) Prohibit the shipment of green cheese or short-weight goods.’

‘BUTTER.

Supplies from Canada were not sufficiently large to warrant any special remark.

‘*Quality and condition* were practically the same as former seasons, but prices in Canada were relatively too high compared with Irish and continental supplies.

‘In conclusion we should like to refer to the great care exercised by the Canadian government and dairy associations over the production and transit of dairy produce, and to assure them that their efforts are appreciated by importers on this side.

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'If we may be allowed to offer suggestions to them for the future, they would be that, while not relaxing their present work, they devote increased attention to:—

'(1) Discouraging small factories.

'(2) Making it compulsory to have cool-curing rooms at each factory.

'(3) Raising the status of cheese and butter-makers.

'(4) Developing production by getting farmers to make provision against droughts by laying in supplies of green food, ensilage, &c., and to develop the milking strains of their herds.

'(5) Prohibit the shipment of green cheese or short-weight goods.'

Copy of letter from W. & M. Gilmour, Glasgow, dated January 19, 1909.

'The quantity of Canadian butter coming to our market this season has been exceedingly small, principally for the reason that the prices ruling in Canada were higher than we could pay here. The different lots that we did bring forward showed quality equal in standard to former years' production, and fortunately all lots we imported have been free from mould or spots, either on parchment or butter. This is a very serious thing when it does occur (which unfortunately it does too often), as the loss is ruinous to the importer, and anything that can be done in Canada to remedy this matter should have the earnest consideration of every one interested in the production and packing of butter for our market.

'Our opinion is that the standard of quality of Canadian butter has been improved within the past six or eight years, but there is still further advance to be made in this direction so that we may get absolutely away from anything in the nature of fishy flavour developing when the butter reaches this side.

'The packing of the butter is generally well done, with the exception of a few lots where we find the butter badly finished off on the top, and very often this could be avoided by using only boxes of the right size sufficiently filled to the top to look attractive.

'Another point of special importance is that no boxes intended for shipment to our market should contain more than fifty-six pounds net. Irregular weights should be strictly prohibited, as they only lead to confusion and annoyance to the retailer, who has to be seriously considered in the distribution of the butter. It is our earnest hope that irregular weights will soon be a thing of the past.

'The improvement of the sailings to our port and the better class steamers has had the advantage of landing the butter in better condition; therefore, we have had almost an entire absence of heating in transit.

'In conclusion, if only fresh made butter of strictly 'choicest' quality, pale in colour and very lightly salted, is shipped to Glasgow (as only butter of this class will compete with Danish and Irish creamery, which are largely sold here), we see no reason to prevent a much larger trade in Canadian creamery whenever your production permits of larger export.

Copy of letter from Simons, Jacobs & Company, Glasgow, dated January 20, 1909.

FRUIT—APPLES AND PEARS.

We give a résumé of this business up to the present. It has been of a varied character, being in some respects encouraging and in others the opposite. The latter case was brought about by unsatisfactory conditions during the period when shipments of fall fruit were made. Hot spells prevailed and considerable detentions arose through the untoward effects of forest fires. Shipments from these causes arrived in a very bad condition and had to be realized with disastrous results. This market would have taken these apples and paid well for them under normal circumstances. As far as this type is concerned, Glasgow offered greater advantages than other places in respect that Scotland had few or no apples and early fruit was quite abundant in many parts of England; especially in what are known there as the 'home counties' which affect chiefly the London market. This is best illustrated by

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the results of the cargoes of Gravensteins which were dispatched from Nova Scotia. Those sold in Glasgow realized satisfactorily, which could not be said in respect of what took place elsewhere. Winter stock shipped from Halifax was a feature of this market, as it has not been before. It was unusually fine. What militates against this fruit is the barrel in which it is packed. The Scottish trade is accustomed to the full-sized Ontario package and the wholesale people are at a disadvantage with anything smaller, even when a relatively lower price is demanded. In our opinion could a standard barrel be established, although heavier, it would be of great advantage as the extra quantity contained in it would be paid for and the same quantity of fruit being carried in a lesser number of packages would constitute an important saving in freight and expenses.

'At the outset of the season it was expected that crops of apples generally would be abundant and this was commented upon in the public press of this country, leading buyers and consumers to believe that low prices would rule. Early shipments of winter stock realized moderate figures but it soon became apparent that, through climatic reasons, the anticipations of abundance would not be fulfilled. This, along with a revival of trade in the United States, established an improved value, which as time progressed became more and more emphasized until to-day, when supplies have so much diminished, the advance in value, especially on cold storage stock, may be estimated as ruling from 70 to 100 per cent, and it appears to be evident that there will be no retrograde movement. It is very doubtful, however, whether there will be any further increase, as high prices have undoubtedly checked the demand. That the estimate of the European crop was not exaggerated is proved by the fact that on the continent of Europe there are at this moment considerable quantities of apples of various kinds which are now finding buyers in Great Britain. Hitherto there was no opening for them, but the great advance in the price of Americans, as herein stated, has given the European holders the opportunity which they stood very much in need of.

'Contemplating the season as a whole, it gives once more a conclusive proof of the high estimation in which Canadian fruit is held here. This will be continuous and will suffer no check except when prices are driven up to such a point as to put the supply beyond the reach of the bulk of the people.'

Copy of letter from Jas. Lindsay & Son, Edinburgh, dated January 20, 1909.

'We take this opportunity of giving you a few particulars regarding our opinion of apples in general arriving throughout the season. To begin with summer apples, shipments of these commenced of fairly good quality and fairly well packed, just about as near the Marks Act standard as we could possibly expect them. This continued for some time when a complete change came over them in packing, quality, condition, &c., all falling off very much, and whenever this took place prices dropped at once. This state of affairs continued until the finish of the summer apples.

'When winter apples commenced they were medium to start with, but they gradually improved, although we regret to say many lots were of inferior grade and not up to the packing standard, but the bulk of the shipments were fairly well up. Later shipments of Canadians, say packed ex. storage, are very much better handled and very much more correctly packed. They are what we call full standard packing. The quality of many of them is nice, everything that could be desired, and in consequence of same they have made full prices. We expect this to continue now until the finish of the season, which will be very shortly.

'*Nova Scotian Apples.*—We have not been much interested in them, but so far as our inspection has gone they have been from fair to good, better this season than we ever saw them. We term it the best season Nova Scotia has ever had, as in the absence of big supplies from Canada and elsewhere, they have got a particularly good chance, which they would not have received had there been an ample supply from Canada.

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'*Western States Apples* have been from fair to good; many shippers have excellent stuff, indeed superior to Canadians in quality. We were always of opinion Canadian Baldwins were the best, but lately we have changed our opinion. We find the flavour of Western State Baldwins surpasses the Canadians, and for keeping quality it is quite as strong, so that it is an apple worth looking after.

'It is important to note that when apples are thoroughly well packed the demand continues good, and buyers give full and satisfactory prices, but whenever they find the packing to go below the standard it is detected immediately and the prices suffer very materially, much more so than they really should, but such is the result of indifferent packing.'

Copy of letter from Thomson & Mathieson, Glasgow, dated January 10, 1909.

'*Canadian Pears*.—We have had considerable supplies of these during the past season, which arrived in varying conditions, some lots in perfect order realizing big prices, and others over-ripe and had to be sold at a loss. Pears in general, we should say, should all be shipped in cold storage, and they ought to be pulled to the green side. The best carrying sorts are Duchess and Anjou. The Bartlett is a favourite here if it can be got sound, but it requires to be very carefully packed. Personally we prefer to handle Duchess and Anjou, as they almost invariably make money for the shippers. Keiffers, if clear in skin, sell fairly well as a common pear. We consider the 20-pound case the best package.

'*Apples*.—The apple season, which is now well advanced, has been much shorter than usual, and we should say it will prove a profitable one for all those who have handled quantities, the larger speculators specially having made a great deal of money on apples sold in December and January. Nova Scotia this year has had a wonderful crop and realized high prices. Of course, these speculators who have made so much money this season require to make something very substantial to compensate them for the great losses which they sustained last season.

'We would recommend growers of apples to hold and consign on their own account, as they are certainly entitled to a larger share of the profit than they have got this season. The apple is growing in favour and no one need fear holding good stock and consigning it to reliable brokers on this side. The only serious drawback this season was the large quantity of fall apples which arrived in the early part of the season wasty and lost money.'

Copy of letter from R. & W. Davidson, Glasgow, dated January 13, 1909.

'In reply to your request for a report regarding our importations of Canadian apples and pears in boxes, we have little to add to the information we have furnished you with verbally from time to time throughout the season. We have received consignments of large quantities of boxes from a number of growers' associations, and we find a rapidly increasing appreciation of this package on the part of those dealers who cater mostly for a high-class family trade.

'We look for a steady growth in the demand for the box package, provided carefully selected and well graded fruit only is packed in same, and when the fruit is really tip-top a ready outlet at considerably enhanced prices can be relied on, but shippers must not imagine that they have only to pack ordinary quality in the box package to ensure better returns than if the same fruit were packed in barrels. They will certainly always get as good a price for No. 2 grade in boxes as they will get in barrels, but they must not expect more.

'In the early part of the season some of the varieties, notably Greenings and Snows, were very seriously damaged by apple scab and a white fungus growth, which made the fruit nearly unsaleable and resulted in very heavy losses, but in all cases where the fruit was clean and well handled very satisfactory prices were realized.

'*Pears*.—Shipments of Duchess, Clairgeou, Anjous and Winter Nelis realized satisfactory prices in all cases where they arrived in sound condition, but large quan-

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titles of Keiffers were disposed of at prices which must have been disappointing to the shippers, being unsuitable for the trade.

The public in this country have not yet been educated to the use of stewing pears, and if an outlet for these in this country is going to be necessary it would, in our opinion, be desirable for growers to get up well devised cooking directions and have them printed and two or three dozen slips put into each box, and a printed request added to the retailer to distribute these cooking directions along with the fruit when selling same to the consumers. Whilst the public in this country cook enormous quantities of apples, they have hitherto used pears only for fresh consumption at the table, with the exception of canned pears from California. We are of opinion, however, that if carefully prepared cooking directions were issued along with the fruit, a trade for Keiffers would probably be developed.

Canned Apples.—Some of the brands imported by us this season manifest a decided falling off in quality compared with previous seasons; others are quite up to their former standard.

Copy of letter from Thomas Russell, Glasgow, dated January 21, 1909.

Referring to your call the other day, we beg to say that the Canadian apple season, 1908-9 has been somewhat peculiar in many respects and notably on account of the very disastrous experiences at the beginning of the season. The crop of summer fruit was very heavy and a larger quantity than usual was exported in the month of September last, and the almost unprecedented hot weather which we had at that time and the delay to steamers in the St. Lawrence, after loading, on account of smoke from forest fires, had a most prejudicial effect on the condition of the fruit and many lots were landed here in deplorably bad order, and having to be immediately realized were sold at much reduced prices. The warm weather at the time the apples were being packed and while in transit, and the fact of the apples themselves not being cooled before packing, caused many of the varieties, Greenings and such like especially, to arrive very badly spotted and in slack condition.

When the weather conditions got better and the harder varieties of fruit began, there was an immediate improvement in the arrivals and in consequence an increased demand and higher prices at once ruled, and so far as winter fruit is concerned the season may be said to have been quite satisfactory.

It must be taken into account, however, that the winter crop was appreciably lighter than for a number of years, and, when it is considered that the general trade of this country was at a very low ebb and the purchasing power of the people reduced to a minimum, very much lower values would have been obtained if the crop had been a normal one. Owing to the scarcity of 'Canadian' winter stock and to the fact of there being a very large crop of apples in Nova Scotia, an opening arose on our market for the latter and there was an exceptionally good demand but, through what we consider as an iniquitous condition attached to the charter of a portion of the space of steamers from Halifax to Glasgow, excluding free shipments of apples, a monopoly was created on the Glasgow market and the trade considerably curtailed to the detriment of all connected with it.

REPORT OF BRISTOL CANAL INSPECTOR.

(Capt. H. E. Shallis.)

BRISTOL, January 13, 1909.

I herewith submit particulars of the work for the past year for the Port of Bristol, and also inclose some letters I have received from the various merchants of this Port and of Cardiff, giving their respective views of the imports in which they are interested.



KING EDWARD VII. and PRINCE OF WALES, shaking hands, before the Coronation, London, June 26, 1902.

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CHEESE.

Taking the winter and summer sailings together, we have received in round figures about 390,000 boxes. As it is during the summer season that we have any trouble to contend with, I will refer to these shipments. From my own observations there has been a considerable improvement in the quantity of heated cheese as landed at the docks, compared with previous years; in fact, I may say that, with only one exception, there is no complaint at all in this direction. I have been in frequent touch with the different merchants and on this point they are all of the same opinion. One matter that has been drawn to my notice is the great amount of shrinkage, which has been particularly noticeable this season and which the receivers attribute to the fact that the cheese were sent forward in too new a condition. We have also had cases where on the cheese being cut, the centre was found to be filled in with some different and inferior quality, thereby spoiling the sale.

A large percentage still exists in the matter of broken boxes, though I am of opinion that there is an improvement in this direction, the chief breakages being in boxes from the Quebec districts, the wood seeming very brittle and apt to split at the least knock. The boxes from Ontario sections are much cleaner in appearance and stronger in every respect; the sewn type of box is no doubt the best for preventing breakage. Again in Quebec shipments we had numerous instances of the box being too large for the cheese, or vice versa.

BUTTER.

There has been a great improvement in the quantity to hand this year as compared with last, having received over 54,000 packages. The quality, generally speaking, has been very good, though in some cases there has been quite a fishy flavour, and in October last a quantity arrived here which has turned out very spotty and mouldy. This matter the merchants are taking up with the shippers, as they are unable to account for same. As to the boxes there is little to complain of, breakages being few, but still they are not as securely bound together as they might be and do not compare for strength with the New Zealand butter boxes.

BACON.

There is a slight increase in these shipments and what has come to hand has turned out good. The packages would be better if strengthened at the edges.

APPLES.

Our totals for the past season compare favourably with the previous year, and the arrivals during the latter part of the year showed a marked improvement both as to quality and packing. Cardiff received the most of the shipments landed at this port. Two lots came to hand for Birmingham in a very bad condition, but these were apparently packed and shipped in an over-ripe condition. The apples have this season been well and carefully graded, though there has been a slight increase of spotted apples especially with Russets and Northern Spies. The barrels have been strong and better marked and branded and the slacks fewer.

With regard to the general working of the cargoes, I am pleased to say that we are all the time making some improvement, the goods being handled with care and sent forward without delay. In the case of butter, if no receiving orders are to hand by the end of the day on which it is landed, it is at once sent to the cold storage on the dock, so that it does not suffer in any way. The ships to this port have all during the season run their refrigerator and cooled air chambers most satisfactorily and without any mishap. The ss. *Roman*, of the Dominion Line, has no refrigerator or cooled air accommodation, but is fitted up with good fans and has showed good re-

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sults. The new dock was opened on July 9 and is now in full swing, and I am indebted to both the steamship and dock officials, with whom I am frequently in touch, for their courtesy and willingness to do all possible in the interest of Canadian produce.

Copy of letter from H. H. & S. Budgett & Co., Ltd., Bristol, dated December 18, 1908.

'*Canadian Cheese, 1908.*—As regards condition, we are pleased to be able to report favourably, taking the season as a whole, no cases of heated or badly carried cheese having come under our notice. Early in the season, however, you will remember, we had a few cheese which held some filled curd.

'As to quality, this has also been good, although perhaps not as good as usual, the cheese having had a tendency to become "tasty" rather sooner than in recent years. This may be accounted for by excess of moisture.

'*Shrinkage.*—We now come to the most important and striking point of the season's trading. Whether owing to defective make, method of carrying, improper marking of weights at factories, or incorrectness of weigher's average in Montreal, the loss in weight which has taken place between Canadian shipper and English importer has been phenomenal; differences of as much as 15 pounds on 5 cheese having been noticed.

'We lay particular stress on the importance of this point. The very heavy losses thrown upon importers thereby are bound in the end to militate against the Canadian article.

'The allowance made by New Zealanders in nearly all cases covers the loss sustained during a much longer period of transit.'

Copy of letter from Gardner, Thomas & Co., Bristol, dated December 28, 1908.

'In accordance with promise, we are just giving you underneath our opinion of the general condition of cheese which we have received this season from Canada. The cheese themselves have generally been in good condition. There have been just one or two shipments which showed heat, but we were of opinion that this was the fault of the boat. Some of the parcels also appeared to us to be shipped *much too young*, and we think if this continues to any great extent it must affect the consumption, as the cheese get into the grocers' hands before they are really fit to cut. The boxes from the Quebec district generally arrive in rather a rough state; they do not appear to be strong enough to carry the cheese. The heavier cheese which we receive from the Brockville and Ingersoll sections are much stronger and they arrive in far better condition and present a very much better appearance. This fault in the Quebec sections has, we believe, been mentioned several seasons, and it would help the sale of the goods if they could be brought over in presentable state.'

Copy of letter from Pullin, Thomas & Slade, Bristol, dated January 13, 1909.

'In reply to your inquiry respecting condition on arrival of Canadian cheese this year, we beg to say that with regard to summer heating we have had no cause to complain whatever, as every parcel has been landed in good condition in that respect.

'What, however, we have found very serious cause to complain of is the excessive shrinkage of the goods in transit, but this we do not attribute in any way to any conditions of transit, but arises, we feel certain, from the cheese being shipped too new, not properly matured before leaving the factory.

'We do not know whether this is within your department, but we certainly think it should be brought within the notice of the Canadian government, as it is not only the matter of shrinkage, but also it is detrimental to the proper maturing of the goods altogether and very injurious to the trade generally.

Copy of letter from Pullin, Thomas & Slade, Bristol, dated January 13, 1909.

'We are obliged to you for the close attention you have given to the arrivals of the Canadian produce on our Bristol boats. As far as the carrying is concerned, we

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consider the past year one of the most satisfactory we have had, only one or two parcels during the whole season showing the slightest signs of heat, besides which we are confident the boxes on the whole have arrived in a less damaged condition than they sometimes have. We have before pointed out to two or three of the representatives of the Canadian government both in Canada and on this side the harm that has been done to the trade by cheese being shipped out too young, and although this has been somewhat remedied during the past year, at the same time they have not been quite as they should have been in this respect, many of the cheeses appearing to leave the factory within seven or ten days of having been made, which certainly is not fair on the produce. If strict regulations were made in this respect, so that all makers should be put on the same footing, they would all benefit by it in the long run. This is a very important point, especially seeing that New Zealand is making such a big bid for the English trade. Up to the present we have been able to make a big premium for Canadian cheese over New Zealand, but unless every care is taken by your countrymen to hold this, they may find the result very shortly the opposite. The New Zealand government are taking every possible care with regard to their produce, besides which they have the advantage of the long voyage in suitable stowage where the cheese are gradually maturing. Another thing we should like to point out to you is the unsatisfactory average loss allowed in many instances to buyers on this side, who have absolutely no claim against shippers on the other side. The regulations in this respect do not seem to be quite as they should be, especially seeing the men on this side are so entirely in the hands of the sellers.

The arrangement we have when buying New Zealand cheese is that we get an allowance of one per cent which invariably more than covers the loss in weight on passage which, considering the long journey, we feel sure you will agree is highly satisfactory, whereas with cheese from Canada, although the journey only takes from seven to ten days, we always expect to find a loss of one to one and a half pounds per box.

Copy of letter from W. Titley & Sons, Bristol, dated January 7, 1909.

‘In reply to your inquiry, we have no particular fault to find with condition of goods shipped from Canadian ports during the past season.

‘Cheese generally has arrived in a less heated condition than heretofore and this we attribute to the cooled air storage with which most of the steamers have been fitted. The boxes in which the cheese are packed leave much to be desired; the wood is very frail and, in numerous cases, the boxes have not been large enough or strong enough to bear the weight.

‘We have cause to make serious complaints in regard to weights. The difference between actual and marked weights during the past season has been most marked, entailing considerable loss on the importers. This is a matter that the Canadian government ought to take up with the factorymen and endeavour to obtain much more liberal scaling.

‘At the early part of the season the cheese were shipped much too young and were not suitable for use for some time after they were landed. We do not think cheese ought to be shipped from the factories until they are at least ten or fourteen days old, and we believe that if this policy was carried out it would be much to the interest of not only the shippers on this side, but would result in an increased appreciation of the quality of Canadian cheese.

‘In regard to *butter* the quality has been fairly good, but still there are many factories that have a fishy flavour, and the butter generally is not up to the standard of the best New Zealand or Australian factories. Boxes also are not nearly as strong as they should be, many of them being broken and the butter exposed when landed, which, of course, is very detrimental to the quality.’

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Copy of letter from Whitefield & Company, Cardiff, dated January 5, 1909.

'With regard to the condition of Canadian produce, we find that bacon and butter are usually in a very good condition, and there is not much to complain of in the condition and pack of the cheese, but what is a very serious grievance, and will have to be remedied sooner or later, is the excessive short weight on all Canadian cheese. It is nothing unusual for a cheese to show a shrinkage of six, eight or even ten pounds. Of course, the cheese could never shrink this much and there must be some swindling going on on the other side. This is not a recent occurrence, but has been the general complaint for the last two or three years and will ultimately tell against Canadian cheese, as the only place now where we are unable to get weight from is Canada.'

BUTTER TRANSPORTATION.

From May 11 to October 17, the special iced car services for the carriage of butter to Montreal were again in force, the Dairy and Cold Storage Commissioner's Branch making the arrangements, as usual. Cars were run over 62 routes, and notwithstanding the fact that the summer was long and hot, the service all round was the best on record. The cars as a rule reached their destination on time, the icing was well looked after, and, generally speaking, the whole service was superior to that of former years. The cars on the various routes were closely looked after by this division, six inspectors being employed in this work, and any irregularities which were discovered were promptly brought to the attention of the railway companies, and, as a rule, were quickly remedied. A larger quantity of butter was carried in these cars than during the previous season, and, as a consequence, the deficit which had to be met by the department was smaller than in 1907. Owing to the extremely warm weather both creamery and dairy butter was loaded in a warmer condition than in 1907, but as the cars were well iced, the average temperature of the butter at Montreal was about the same as the preceding season. In the early part of the summer a circular was sent to the shippers of dairy butter in Western Ontario pointing out that their shipments were usually loaded in the car in very warm condition, to the detriment of the creamery butter carried in the same car. They were asked, as far as possible, to provide cool storage for their butter while it was awaiting shipment and to see that it was not sent to the railway station until about the time the way-freight was due. This circular undoubtedly had some effect, as a considerable improvement in the temperature of dairy butter was noted by our inspectors during the latter part of the summer. Our Ontario inspector came into Toronto the end of each week to see the cars unloaded and the Montreal shipments transferred. He noted the temperature of the butter as it was removed from the cars and was on hand when the through cars were being iced. The temperature of the butter tested in the Toronto yards have been averaged and the results are shown in Table No. 4.

TEMPERATURES OF QUEBEC BUTTER.

The following tables show the temperatures of butter at railway shipping points in the province of Quebec during the season of 1908:—

SESSIONAL PAPER No. 15a

TABLE No. 1.—AVERAGE TEMPERATURES OF BUTTER AT QUEBEC RAILWAY SHIPPING POINTS, SEASON, 1908. (INSPECTOR F. A. KNOWLTON.)

| Creamery. | Location. | Railway. | No. of Packages Tested. | Average Tem- perature. |
|-------------------------------|-----------------|------------------|-------------------------------|------------------------------|
| | | | | Deg. |
| Bromptonville... | Bromptonville | G.T.R. | 3 | 42.0 |
| Franklin Centre (N.B.3)..... | Ormistown | G.T.R. | 4 | 42.5 |
| Sawyerville | Sawyerville | C.P.R. | 3 | 43.3 |
| Huntingdon (32)..... | Huntingdon | G.T.R. | 3 | 43.3 |
| Bedford | Bedford | C.P.R. | 9 | 43.9 |
| Eastman | Eastman | O.M. & C.P.R. | 3 | 44.0 |
| Vale Perkins | Mansonville | O.M. & C.P.R. | 4 | 45.5 |
| Bromptonville (J.G.) | Bromptonville | G.T.R. | 4 | 46.0 |
| Mansonville | Mansonville | O.M. & C.P.R. | 4 | 46.5 |
| Franklin Centre (N.B.2)..... | Ormistown | G.T.R. | 4 | 47.0 |
| Magog | Magog | B. & M. & C.P.R. | 58 | 47.3 |
| Malboro | Kingstary | O.M. & C.P.R. | 4 | 47.5 |
| St. Francis Creamery | Richmond | G.T.R. | 4 | 47.5 |
| Mystic | Mystic | C.P.R. | 6 | 48.0 |
| Knowlton | Knowlton | C.P.R. | 16 | 48.5 |
| Fairfax | Ayer's Cliff | B. & M. & C.P.R. | 8 | 48.5 |
| L'Ange Gardien (Olive)..... | L'Ange Gardien | C.P.R. | 4 | 48.5 |
| L'Ange Gardien (Ivy)..... | L'Ange Gardien | C.P.R. | 4 | 48.5 |
| Kingsy | Richmond | G.T.R. | 4 | 48.5 |
| Warden | Warden | C.P.R. | 16 | 48.6 |
| Fitch Bay | Smith's Mills | B. & M. & C.P.R. | 23 | 48.8 |
| Iron Hill | West Shefford | C.P.R. | 25 | 49.2 |
| L'Ange Gardien (Lily Dale)... | L'Ange Gardien | C.P.R. | 3 | 49.3 |
| Coaticook | Coaticook | G.T.R. | 8 | 49.4 |
| Stanstead | Stanstead | B. & M. & C.P.R. | 16 | 49.8 |
| Dunham | Stanbridge East | C.V.R. | 8 | 50.0 |
| Laroche | Laroche | C.P.R. | 15 | 50.0 |
| West Shefford | West Shefford | C.P.R. | 39 | 50.2 |
| Rockburn | Ormistown | G.T.R. | 4 | 50.5 |
| Barnston Corner | Barnston | G.T.R. | 7 | 50.9 |
| Stanbridge East | Stanbridge East | C.V.R. | 16 | 50.9 |
| Missisquoi | Freighsburg | C.V.R. | 12 | 51.0 |
| Mount Orford | Cherry River | B. & M. & C.P.R. | 47 | 51.1 |
| St. Evariste (D.23)..... | St. Ephrem | Q.C.R. | 3 | 51.3 |
| St. Evariste | St. Ephrem | Q.C.R. | 3 | 51.3 |
| North Stanbridge | Stanbridge East | C.V.R. | 12 | 51.7 |
| North Hatley | Ayer's Cliff | B. & M. & C.P.R. | 12 | 51.7 |
| St. Edwidge | Coaticook | G.T.R. | 8 | 51.8 |
| East Hatley | Ayer's Cliff | B. & M. & C.P.R. | 8 | 52.0 |
| St. Armand | St. Armand | C.V.R. | 9 | 52.2 |
| St. Ephrem (56)..... | St. Ephrem | Q.C.R. | 6 | 52.3 |
| St. Etienne | Eastman | B. & M. & C.P.R. | 42 | 52.3 |
| Martinvale | Martinvale | C.P.R. | 3 | 52.7 |
| Roxton Pond | South Roxton | C.P.R. | 3 | 52.7 |
| Lennoxville | Lennoxville | B. & M. & C.P.R. | 5 | 52.8 |
| Stanbridge Station | Stanbridge | C.V.R. | 9 | 52.9 |
| Herdman's (N.B.5)..... | Huntingdon | G.T.R. | 4 | 53.0 |
| Wickham | Wickham | C.P.R. | 15 | 53.1 |
| St. Hermenegilde | Coaticook | G.T.R. | 7 | 53.1 |
| Ste. Rosalie | Ste. Rosalie | C.P.R. | 3 | 53.3 |
| Cote St. Joseph | Bromptonville | G.T.R. | 6 | 53.6 |
| Compton | Compton | G.T.R. | 9 | 53.6 |
| Pike River | Stanbridge | C.V.R. | 9 | 54.0 |
| Baldwin's Mills | Baldwin's Mills | G.T.R. | 8 | 54.0 |
| Roxton East | Roxton Falls | C.P.R. | 4 | 54.0 |
| Katevale | Magog | B. & M. & C.P.R. | 63 | 54.2 |
| St. Simon (Dale 21) | St. Simon | C.P.R. | 4 | 54.3 |
| St. Pie (L.C. 99)..... | St. Pie | C.P.R. | 4 | 54.5 |
| Dunham (Acme) | Stanbridge East | C.V.R. | 4 | 54.5 |
| South Roxton | South Roxton | C.P.R. | 3 | 54.7 |
| S. B. No. 1 | Coaticook | G.T.R. | 4 | 55.0 |
| St. Remi | St. Remi | G.T.R. | 1 | 55.0 |
| Durocher | Durocher | C.V.R. | 2 | 55.0 |
| Huntingdon (Star) | Huntingdon | G.T.R. | 3 | 55.3 |
| E. T. Dairy Produce Co. | Ayer's Cliff | B. & M. & C.P.R. | 8 | 55.3 |
| Holton | St. Remi | G.T.R. | 8 | 55.5 |

AVERAGE TEMPERATURES OF BUTTER—Continued.

| Creamery. | Location. | Railway. | No. of Packages Tested. | Average Temperature. |
|--------------------------------|-----------------------|--------------|-------------------------|----------------------|
| | | | | Deg. |
| L. P. 27. | St. Ephrem | Q.C.R. | 6 | 55.7 |
| St. Simon. | St. Simon. | C.P.R. | 3 | 56.0 |
| South Stukley. | South Stukley | B.&M.&C.P.R. | 36 | 56.4 |
| I. 2. C. | St. Ephrem | Q.C.R. | 6 | 56.7 |
| Hemmingford | Hemmingford | G.T.R. | 10 | 56.8 |
| White Daisies. | St. Ephrem | Q.C.R. | 9 | 56.9 |
| North Shefford. | South Roxton. | C.P.R. | 9 | 57.3 |
| Rockside No. 4. | St. Pie. | C.P.R. | 4 | 57.3 |
| R. 3. | St. Ephrem | Q.C.R. | 6 | 57.3 |
| West Dunham | Stanbridge East. | C.V.R. | 16 | 57.4 |
| Canada A. 21. | Compton. | G.T.R. | 9 | 57.4 |
| Fridette and Pachaud. | Sherrington. | G.T.R. | 14 | 57.4 |
| Royal Canadian Factory. | St. Pie. | C.P.R. | 4 | 57.5 |
| Notre Dame de Stanbridge. | Des Rivieres. | C.V.R. | 3 | 58.0 |
| Maple Leaf | St. Remi. | G.T.R. | 8 | 58.3 |
| Frontier | Hemmingford | G.T.R. | 4 | 58.5 |
| Barrington | Barrington. | G.T.R. | 2 | 59.0 |
| Rivart and Lefebvre. | Sherrington. | G.T.R. | 5 | 59.2 |
| St. Michel. | St. Michel. | G.T.R. | 4 | 60.0 |
| St. Brigide | St. Brigide. | C.V.R. | 3 | 60.0 |
| Roxham | Hemmingford | G.T.R. | 3 | 60.0 |
| Abbotsford. | Abbotsford. | C.P.R. | 2 | 60.0 |
| Hill Top, Canada. | St. Ephrem. | Q.C.R. | 3 | 64.0 |

In the foregoing table the lowest average temperature is 42 degrees and the highest 64 degrees. In 1907 the extremes were 36.6 degrees and 56.8 degrees; in 1906, 38 degrees and 64 degrees; and in 1905, 41.8 degrees and 62.5 degrees.

TABLE No. 2.—AVERAGE TEMPERATURES OF BUTTER AT QUEBEC RAILWAY SHIPPING POINTS, SEASON 1908. (INSPECTOR J. N. LEMIEUX.)

| | | | | |
|---------------------------------|------------------------------|-----------------|----|------|
| Joseph Fleury | Louisville. | C.P.R. | 5 | 42.2 |
| Pierre Proulx | Methot's Mills. | G.T.R. | 13 | 43.1 |
| S. Comtois (1,271). | St. Gabriel de Brandon. | C.P.R. | 4 | 43.7 |
| Geo. Bennett (Hazel Bank). | New Glasgow. | C.N.Q.R. | 2 | 44.5 |
| J. A. McCallum. | Danville. | G.T.R. | 11 | 44.9 |
| François Roy. | St. Philippe. | I.C.R. | 7 | 45.1 |
| D. Guilbault. | St. Gabriel de Brandon. | C.P.R. | 3 | 45.3 |
| E. Demers. | St. Arsène. | I.C.R. | 12 | 45.4 |
| A. Dandeneau. | St. Gabriel de Brandon. | C.P.R. | 5 | 45.4 |
| Nap. Brochu. | Parisville. | L. & M. | 5 | 45.6 |
| Felix Dansereau. | Verchères. | Q. M. & S. | 7 | 45.7 |
| Oyris Godbout (B). | St. Eloi. | I.C.R. | 6 | 46.1 |
| Israel Dion. | Papineau. | C.N.Q.R. | 3 | 46.3 |
| Arthur Lupien. | St. Wenceslas. | I.C.R. | 2 | 46.5 |
| Eugene Cote. | Isle Verte. | I.C.R. | 10 | 46.7 |
| W. Gareau. | St. Jérôme. | C.N.Q.R. | 10 | 46.9 |
| G. Bennett (Elm Bank). | New Glasgow. | C.N.Q.R. | 4 | 47.0 |
| Arthur Grenier. | Joliette. | C.N.Q.R. | 1 | 47.0 |
| Forget & Parthenais. | Bruchesi. | C.P.R. | 2 | 47.0 |
| W. H. Wilson. | St. Agapit. | G.T.R. | 8 | 47.2 |
| Auguste Breton. | St. Arsène. | I.C.R. | 13 | 47.3 |
| C. Guillard. | St. Eustache. | C.P.R. | 5 | 47.4 |
| J. A. Sardon. | St. Arsène. | I.C.R. | 7 | 47.5 |
| A. Michaud. | Rimouski. | I.C.R. | 2 | 47.5 |
| J. Levasseur. | Little Metis. | I.C.R. | 3 | 48.0 |
| O. Cardinal. | L. d'Alle. | C.P.R. | 2 | 48.0 |
| A. Lapalme. | Cavignac. | C.P.R. | 2 | 48.0 |
| C. Dandelin. | St. Pie. | C.P.R. | 2 | 48.0 |
| Irene Thibault. | Cacoma. | I.C.R. | 5 | 48.2 |
| A. A. Nicole. | Trois-Pistoles. | I.C.R. | 7 | 48.2 |
| Gendreau & Imbeau. | Little Metis. | I.C.R. | 6 | 48.3 |
| J. B. Grenier. | St. Rosalie. | C.P.R. | 5 | 48.4 |
| Syndicat St. Paschal. | St. Paschal. | I.C.R. | 7 | 49.0 |

SESSIONAL PAPER No. 15a

AVERAGE TEMPERATURES OF BUTTER—Continued.

| Creamery. | Shipping Station. | Railway. | Number of Packages Tested. | Average Tem- perature. |
|----------------------------|------------------------|----------------|----------------------------------|---------------------------|
| | | | | Deg. |
| Philibert Gauthier. | Little Metis | I.C.R. | 6 | 49.0 |
| Jos. Anctil. | Little Metis | I.C.R. | 5 | 49.2 |
| A. Mercier | St. Agapit | G.T.R. | 15 | 49.2 |
| A. Coupal. | Henryville. | Q.M. & S. | 6 | 49.3 |
| J. J. Allain. | St. Raymond | Q. & L. St. J. | 2 | 50.0 |
| P. Lavallo. | St. Gabriel de Brandon | C.P.R. | 6 | 50.0 |
| J. de L. Taché | Richmond | G.T.R. | 11 | 50.3 |
| A. Ravenelle | St. Pie. | C.P.R. | 2 | 50.5 |
| A. A. Nicole. | St. Simon. | I.C.R. | 7 | 50.6 |
| O. Mercier | St. Charles Junction | I.C.R. | 6 | 50.8 |
| L. Lamothe. | Charnerville | Q.M. & S. | 8 | 50.8 |
| Eugene Roy | St. Eloi | I.C.R. | 10 | 50.9 |
| S. Comtois (O.D. & S.) | St. Gabriel de Brandon | C.P.R. | 4 | 51.0 |
| C. Godbout (Ayer 75) | Isle Verte | I.C.R. | 6 | 51.0 |
| L. A. Boucher | L. Islet. | I.C.R. | 4 | 51.0 |
| O. Gelinas | Charette Mills | C.N.Q.R. | 2 | 51.6 |
| L'Emyer & Chaput | St. Elizabeth | C.N.Q.R. | 9 | 51.1 |
| D. Pelletier | Acton Vale | G.T.R. | 4 | 51.2 |
| Alp. Sansterre. | Little Metis | I.C.R. | 9 | 51.5 |
| E. A. Pepin. | St. Bazile. | C.P.R. | 13 | 51.5 |
| Eugene Godbout. | St. Eloi | I.C.R. | 6 | 51.6 |
| F. Hamel. | St. Agapit | G.T.R. | 15 | 51.6 |
| G. Bennett (Oak Bank). | New Glasgow | C.N.Q.R. | 4 | 51.7 |
| Syndicat de St. Philomene. | St. Philomene | L. & M. | 6 | 51.8 |
| M. Breault. | Montcalm | C.N.Q.R. | 2 | 52.0 |
| Boisvert & Bussiere | Charette Mills | C.N.Q.R. | 1 | 52.0 |
| Henri Diamant | St. Raymond | Q. & L. St. J. | 2 | 52.0 |
| C. Godbout (A.F.) | Isle Verte | I.C.R. | 8 | 52.1 |
| Ludger Rioux. | Trois Pistoles | I.C.R. | 11 | 52.1 |
| Arthur Paris | Parisville | L. & M. | 4 | 52.2 |
| Anthyme Beaudet | Parisville | L. & M. | 7 | 52.2 |
| Eugene Melivier. | L. Islet | I.C.R. | 7 | 52.2 |
| J. O. Naud | Portneuf | C.P.R. | 7 | 52.4 |
| Cassen Bros. | Richmond | G.T.R. | 6 | 52.5 |
| M. Boucher. | Joliette. | C.N.Q.R. | 2 | 52.5 |
| E. Lemaire | St. Guillaume. | C.P.R. | 2 | 52.5 |
| Horace Leroux. | St. Georges | C.N.Q.R. | 5 | 52.6 |
| Grenon Frenes. | St. Barnabe | Q.M. & S. | 20 | 52.9 |
| W. Lamy | St. Paulin | C.N.Q.R. | 2 | 53.0 |
| P. Laroche | Warwick. | G.T.R. | 1 | 53.0 |
| H. A. McNeil Bros | Napierville. | Nap. Jet. | 1 | 53.0 |
| B. Bergeron. | St. Wenceslas. | I.C.R. | 2 | 53.0 |
| H. Gagnon | Little Metis | I.C.R. | 6 | 53.0 |
| A. Gamache. | St. Jean Port Joli. | I.C.R. | 4 | 53.0 |
| E. Dion (B) | Lanoraie. | C.P.R. | 2 | 53.0 |
| Cyris Godbout (C.G.) | St. Eloi. | I.C.R. | 7 | 53.1 |
| F. N. Senay | L'Ange Gardien | C.P.R. | 4 | 53.2 |
| J. B. Theriault | Cacouna | I.C.R. | 11 | 52.2 |
| Isidore Jodoin | Acton Vale | G.T.R. | 5 | 53.2 |
| D. Kerouack | St. Agapit | G.T.R. | 11 | 53.3 |
| A. Belzil. | St. Simon | I.C.R. | 11 | 53.3 |
| J. E. B. Marchand. | La Perle | C.P.R. | 3 | 53.3 |
| Héon & Hélie | St. Wenceslas. | I.C.R. | 2 | 53.5 |
| O. Cardin | Upton. | G.T.R. | 7 | 53.5 |
| Ed. Jean | St. Fabien. | I.C.R. | 12 | 53.6 |
| Cyris Godbout (C). | St. Eloi | I.C.R. | 3 | 53.6 |
| George Roy | Montmagny | I.C.R. | 4 | 53.7 |
| J. C. Rioux | St. Flavie | I.C.R. | 6 | 53.8 |
| N. Deners | St. Agapit | G.T.R. | 5 | 53.8 |
| Dr. Dubé. | St. Agapit | G.T.R. | 7 | 54.0 |
| J. E. Binette. | St. Eustache. | C.P.R. | 2 | 54.0 |
| Jos. Paquette. | St. Eustache | C.P.R. | 1 | 54.0 |
| A. Grise. | St. Roch | Q.M. & S. | 2 | 54.0 |
| T. St. Georges. | Joliette | C.N.Q.R. | 4 | 54.2 |
| J. Dumas | Trois Pistoles. | I.C.R. | 8 | 54.3 |
| Sam Pellerin. | Joliette | C.N.Q.R. | 3 | 54.3 |
| J. O. Naud | St. Bazile. | C.P.R. | 11 | 54.5 |

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AVERAGE TEMPERATURES OF BUTTER—Continued.

| Creamery. | Shipping Station. | Railway. | Number of Packages Tested. | Average Temperature. |
|------------------------|-------------------------|-----------|----------------------------|----------------------|
| | | | | Deg. |
| P. Thibault. | L'Islet | I.C.R. | 2 | 54.5 |
| Jos. Mireault. | Joliette. | C.N.Q.R. | 2 | 54.5 |
| A. Deslauriers. | Charlemagne | C.N.Q.R. | 2 | 54.5 |
| E. Dion (G 618). | Lanoraie | C.P.R. | 5 | 54.6 |
| H. Lessard | St. Paulin. | C.N.Q.R. | 6 | 54.6 |
| W. Ferron. | St. Paulin. | C.N.Q.R. | 3 | 54.6 |
| Jos. Duquette. | St. Jérôme | C.N.Q.R. | 8 | 54.6 |
| Emile Maurice. | St. Liboire | G.T.R. | 6 | 54.6 |
| G. Vachon. | Upton. | G.T.R. | 4 | 54.7 |
| A. Brunette | St. Jérôme | C.N.Q.R. | 4 | 54.7 |
| L. L. Gale. | St. Cyr. | G.T.R. | 6 | 54.8 |
| A. Tremblay. | Dugas | C.N.Q.R. | 2 | 55.0 |
| Alp. Lapointe. | Montcalm | C.N.Q.R. | 2 | 55.0 |
| Ovide Couture | St. Anaclet. | I.C.R. | 5 | 55.0 |
| J. Girouard | Stanford. | G.T.R. | 1 | 55.0 |
| Honoré Rioux. | Danville. | G.T.R. | 2 | 55.0 |
| P. Theriault. | Joliette. | C.N.Q.R. | 3 | 55.0 |
| Albert Lapointe | Joliette | C.N.Q.R. | 3 | 55.0 |
| Lucien Bélanger. | St. Charles Jct. | I.C.R. | 8 | 55.1 |
| John April | St. Arsène | I.C.R. | 6 | 55.1 |
| E. Lanthier. | St. Eustache | C.P.R. | 7 | 55.2 |
| Israel Paradis. | St. Gabriel de Brandon. | C.P.R. | 8 | 55.3 |
| Joseph Ratelle. | Joliette. | C.N.Q.R. | 3 | 55.3 |
| Eugène Asselin. | St. Cuthbert. | C.N.Q.R. | 2 | 55.5 |
| T. M. Wilson Co. | St. Lin. | C.P.R. | 10 | 55.5 |
| A. Robidoux. | Labelle. | C.P.R. | 2 | 55.5 |
| P. F. Arpin. | St. Roch | Q.M. & S. | 2 | 55.5 |
| C. Godbout (W 514). | Isle Verte. | I.C.R. | 5 | 55.6 |
| Philippe Plante | St. Flavie | I.C.R. | 5 | 55.6 |
| John Burns. | St. Julienne | C.N.Q.R. | 4 | 55.7 |
| Frs. Robitaille | St. Gabriel de Brandon. | C.P.R. | 5 | 55.8 |
| Jos. Lemoine | Charlotte. | I.C.R. | 5 | 55.8 |
| Jos. Tremblay. | Little Métis. | I.C.R. | 6 | 55.8 |
| A. Frappin. | Frappin | Q.M. & S. | 1 | 56.0 |
| H. Bergeron. | St. Paulin. | C.N.Q.R. | 5 | 56.0 |
| A. Blouin. | Montcalm | C.N.Q.R. | 2 | 56.0 |
| A. L. Heureux. | St. Gabriel de Brandon. | C.P.R. | 6 | 56.0 |
| A. Lapalme. | St. Hugues. | C.P.R. | 2 | 56.0 |
| J. Rocheleau. | St. Gabriel de Brandon. | C.P.R. | 9 | 56.1 |
| Couture Freres. | Henryville. | Q.M. & S. | 10 | 56.1 |
| Armand Dansereau | Verchères | Q.M. & S. | 5 | 56.4 |
| G. Marion | St. Gabriel de Brandon | C.P.R. | 7 | 56.4 |
| O. Messier | Upton. | G.T.R. | 2 | 56.5 |
| John Houle. | St. Cyr. | G.T.R. | 3 | 56.6 |
| N. Leblanc | St. Gabriel de Brandon. | C.P.R. | 5 | 56.6 |
| J. O. Goyette | St. Liboire | G.T.R. | 5 | 56.6 |
| François Morin | St. Michel. | I.C.R. | 3 | 56.6 |
| Horace Brunelle | Upton. | G.T.R. | 7 | 56.7 |
| E. Beaudry | St. Pie. | C.P.R. | 7 | 56.8 |
| W. Girard. | Acton Vale | G.T.R. | 2 | 57.0 |
| Jos. Gaudet. | St. Marie Salomé | C.N.Q.R. | 6 | 57.0 |
| Z. Gauthier. | Masconche. | C.P.R. | 2 | 57.0 |
| Syndicat St. Roch. | Masconche | C.P.R. | 4 | 57.0 |
| E. Beaudregard | Montcalm | C.N.Q.R. | 2 | 57.0 |
| G. Allard. | Stanford. | G.T.R. | 1 | 57.0 |
| Lodger Lacombe | St. Agathe | C.P.R. | 4 | 57.2 |
| Clément Masson. | St. Etienne | I.C.R. | 5 | 57.2 |
| L. Lecompte. | St. François. | I.C.R. | 4 | 57.2 |
| J. N. Etter | St. Julienne. | C.N.Q.R. | 4 | 57.2 |
| C. Lavolette. | St. Julienne | C.N.Q.R. | 4 | 57.2 |
| R. Chagnon. | Duncan | I.C.R. | 3 | 57.3 |
| J. A. Ratto | St. Pierre R. du S. | I.C.R. | 5 | 57.4 |
| Lachapelle & Lamarche. | St. Julienne. | C.N.Q.R. | 5 | 57.4 |
| L. Lefebvre | Stanford. | G.T.R. | 2 | 57.5 |
| Albert Corriveau. | St. Boniface | C.N.Q.R. | 2 | 57.5 |
| Nap. Roy. | Trois Pistoles | I.C.R. | 2 | 57.5 |
| Denis Larivière. | Lemieux. | I.C.R. | 2 | 57.5 |

SESSIONAL PAPER No. 15a

AVERAGE TEMPERATURES OF BUTTER—Continued.

| Creamery. | Shipping Station. | Railway. | Number of Packages Tested. | Average Tem- perature. |
|-----------------------------|-----------------------------|----------------|----------------------------------|------------------------------|
| | | | | Deg. |
| E. Marchand..... | Daveluyville... | I.C.R..... | 2 | 57.5 |
| J. P. Charpentier .. | Danby..... | G.T.R..... | 2 | 57.5 |
| N. Lussier..... | Acton Vale..... | G.T.R..... | 6 | 57.5 |
| M. McDuff..... | Upton..... | G.T.R..... | 5 | 57.6 |
| Gelinas & Domaine..... | Charette Mills..... | C.N.Q.R..... | 3 | 57.6 |
| D. Brodeur..... | L'Ange Gardien..... | C.P.R..... | 4 | 57.7 |
| A. Tremblay..... | St. Jean Port Joli..... | I.C.R..... | 4 | 57.7 |
| Frs. Painchaud .. | St. Michel..... | I.C.R..... | 4 | 57.7 |
| J. H. Vadnais..... | L'Ange Gardien..... | C.P.R..... | 4 | 57.7 |
| A. Rainville..... | St. Gabriel de Brandon..... | C.P.R..... | 6 | 57.8 |
| Ed. Barrette..... | St. Julienne..... | C.N.Q.R..... | 1 | 58.0 |
| C. Forget..... | Montcalm..... | C.N.Q.R..... | 2 | 58.0 |
| Elz. Beaudoin..... | Warwick..... | G.T.R..... | 1 | 58.0 |
| C. Bernier..... | Cap St. Ignace..... | I.C.R..... | 2 | 58.0 |
| O. Bellehumeur..... | St. Eugene..... | I.C.R..... | 1 | 58.0 |
| F. Caron..... | St. Jean Port Joli..... | I.C.R..... | 5 | 58.0 |
| O. Cardinal..... | St. Lin..... | C.P.R..... | 4 | 58.0 |
| Albert Desrosiers .. | Joliette..... | C.N.Q.R..... | 1 | 58.0 |
| P. Deragon..... | St. Pie..... | C.P.R..... | 1 | 58.0 |
| Etienne Blanchard..... | Upton..... | G.T.R..... | 2 | 58.0 |
| G. Beausoleil..... | St. Alexis..... | C.N.Q.R..... | 4 | 58.2 |
| Elzéar Blais..... | St. Pierre Riv. du S..... | I.C.R..... | 4 | 58.2 |
| Delphis Tetreault..... | Upton..... | G.T.R..... | 4 | 58.2 |
| J. H. Paquette..... | "..... | G.T.R..... | 7 | 58.2 |
| Wilfrid St. Onge..... | Mount Johnson..... | Q.M. & S..... | 4 | 58.2 |
| Alp. Massé..... | Lyster..... | G.T.R..... | 3 | 58.3 |
| Ludger Pellerin..... | Stanford..... | G.T.R..... | 3 | 58.3 |
| H. Lafrance..... | St. Eustache..... | C.P.R..... | 5 | 58.3 |
| U. Roy..... | St. Elizabeth..... | C.N.Q.R..... | 5 | 58.3 |
| J. B. Lanthier..... | St. Jerome..... | C.N.Q.R..... | 6 | 58.3 |
| E. Paquette..... | Upton..... | G.T.R..... | 5 | 58.4 |
| A. L. P. Lanthier..... | New Glasgow..... | C.N.Q.R..... | 2 | 58.5 |
| E. Dion (D I)..... | Larocque..... | C.P.R..... | 2 | 58.5 |
| Télesphore Lizotte..... | St. Louis..... | I.C.R..... | 4 | 58.5 |
| G. E. Duquette..... | St. Hyacinthe..... | G.T.R..... | 6 | 58.5 |
| Aug. Pelletier..... | St. Louise..... | I.C.R..... | 2 | 58.5 |
| Jos. Dessert..... | St. Eustache..... | C.P.R..... | 9 | 58.5 |
| M. E. Tremblay..... | Charnceville..... | Q. M. & S..... | 13 | 58.5 |
| Alp. Jean..... | St. Francois..... | I.C.R..... | 5 | 58.6 |
| L. P. Paradis..... | St. Valer..... | I.C.R..... | 5 | 58.6 |
| Edmond Bélanger..... | Cap St. Ignace..... | I.C.R..... | 4 | 58.7 |
| A. Lussier..... | Bagot..... | I.C.R..... | 7 | 58.8 |
| H. Charland..... | St. Simon..... | C.P.R..... | 5 | 58.8 |
| Ovide Chagnon..... | Upton..... | G.T.R..... | 5 | 58.8 |
| J. D. Blanchette..... | Elgin Road..... | I.C.R..... | 12 | 58.9 |
| C. Vadnais..... | Cavignac..... | C.P.R..... | 2 | 59.0 |
| E. Lefebvre..... | St. Hugues..... | C.P.R..... | 2 | 59.0 |
| Joseph St. Pierre .. | Ste. Rosalie..... | C.P.R..... | 2 | 59.0 |
| A. Langevin..... | St. Pie..... | C.P.R..... | 2 | 59.0 |
| P. Keronack..... | Elislet..... | I.C.R..... | 2 | 59.0 |
| A. Drouin..... | Ste. Sophie..... | C.N.Q.R..... | 3 | 59.0 |
| Louis Lebeau..... | St. Paul l'Ermite..... | C.N.Q.R..... | 2 | 59.0 |
| Wilfrid Pellerin .. | St. Boniface..... | C.N.Q.R..... | 4 | 59.0 |
| O. Bournival..... | Charette Mills..... | C.N.Q.R..... | 3 | 59.0 |
| E. Dion (E. D.)..... | Lanoraie..... | C.P.R..... | 2 | 59.0 |
| Jos. Landry..... | St. Germain..... | I.C.R..... | 2 | 59.0 |
| E. Brosseau (E. B. 8)..... | Ste. Adele..... | C.P.R..... | 4 | 59.0 |
| Joseph Lemonde..... | St. Labore..... | G.T.R..... | 6 | 59.1 |
| Nap. Birtz..... | Contrecoeur..... | Q.M. & S..... | 8 | 59.2 |
| E. Cormier..... | St. Antoine..... | Q.M. & S..... | 6 | 59.3 |
| P. Provost..... | Acton Vale..... | G.T.R..... | 6 | 59.3 |
| Hermas Lacasse..... | Belisle's Mills..... | C.P.R..... | 3 | 59.3 |
| E. Brosseau (E. B. I.)..... | St. Jerome..... | C.N.Q.R..... | 3 | 59.3 |
| N. Heroux..... | Charette Mills..... | C.N.Q.R..... | 3 | 59.3 |
| Jos. Guertin..... | St. Labore..... | G.T.R..... | 5 | 59.4 |
| S. Simard..... | St. Agathe..... | C.P.R..... | 2 | 59.5 |
| Jos. Blanchette..... | Ste. Anne..... | I.C.R..... | 2 | 59.5 |

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AVERAGE TEMPERATURES OF BUTTER—Continued.

| Creamery. | Shipping Station. | Railway. | Number of Packages Tested. | Average Tem- perature. Deg. |
|-------------------------------|-----------------------------|------------------|----------------------------------|--|
| J. W. Kimpton..... | Shawbridge..... | C.P.R..... | 2 | 59.5 |
| A. Lafond..... | St. Gabriel de Brandon..... | C.P.R..... | 2 | 59.5 |
| A. Leclerc..... | St. Eugène..... | I.C.R..... | 9 | 59.5 |
| L. E. Cote..... | Montmagny..... | I.C.R..... | 4 | 59.5 |
| La Cie. de Laiterie..... | St. Pierre..... | I.C.R..... | 4 | 59.5 |
| A. Lemay..... | Daveluyville..... | I.C.R..... | 2 | 59.5 |
| J. O. Fournier..... | St. Charles Jct..... | I.C.R..... | 8 | 59.6 |
| H. Lecompte..... | Acton Vale..... | G.T.R..... | 6 | 59.6 |
| Sweet Milk Condensing Co..... | St. Lin..... | C.P.R..... | 3 | 59.6 |
| E. Sylvestre..... | Duncan..... | I.C.R..... | 3 | 59.6 |
| Lacasse & Blanchet..... | St. Charles Jct..... | I.C.R..... | 3 | 59.6 |
| J. B. St. Pierre..... | St. Philippe..... | I.C.R..... | 7 | 59.7 |
| Nap. Dion..... | St. Canute..... | C.N.Q.R..... | 7 | 59.7 |
| Oscar Gilbert..... | Plessisville..... | G.T.R..... | 4 | 59.7 |
| Arthur Martin..... | St. Roch..... | Q.M. & S..... | 5 | 59.8 |
| A. Deslauriers..... | St. Liboire..... | G.T.R..... | 5 | 59.8 |
| A. M. Methot..... | Warwick..... | G.T.R..... | 2 | 60.0 |
| S. Perreault..... | Stanford..... | G.T.R..... | 1 | 60.0 |
| P. Allard..... | St. Paulin..... | C.N.Q.R..... | 5 | 60.0 |
| Geo. Bennett..... | Paisley..... | C.N.Q.R..... | 3 | 60.0 |
| Fortin & Blanchet..... | Napierville..... | Nap. Jct. R..... | 1 | 60.0 |
| Robillard & Poisson..... | St. Edouard..... | Nap. Jct. R..... | 1 | 60.0 |
| T. Nicolle..... | St. Pierre..... | I.C.R..... | 4 | 60.0 |
| M. Beaulieu..... | St. Vallier..... | I.C.R..... | 10 | 60.0 |
| Jos. Roy..... | St. Vallier..... | I.C.R..... | 2 | 60.0 |
| Morceau & Corriveau..... | St. Vallier..... | I.C.R..... | 5 | 60.0 |
| J. B. A. Genelle..... | St. Germain..... | I.C.R..... | 2 | 60.0 |
| Roch. Gamoche..... | St. Lin..... | C.P.R..... | 3 | 60.0 |
| J. J. Beauregard..... | St. Lin..... | C.P.R..... | 1 | 60.0 |
| H. Provost..... | L'Épiphanie..... | C.N.Q.R..... | 2 | 60.0 |
| Paul Robidoux..... | Cavignac..... | C.P.R..... | 2 | 60.0 |
| J. B. Chagnon..... | St. Pie..... | C.P.R..... | 2 | 60.0 |
| E. Casavant..... | Abbotsford..... | C.P.R..... | 1 | 60.0 |
| Gilbert Brunet..... | St. Georges..... | I.C.R..... | 6 | 60.0 |
| E. Dion (L.C. 81)..... | Lanoraie..... | C.P.R..... | 4 | 60.0 |
| J. P. Rochelleau..... | Abbotsford..... | C.P.R..... | 1 | 60.0 |
| Israel Thoun..... | Ste. Agathe..... | C.P.R..... | 6 | 60.1 |
| A. Provost..... | St. Eugène..... | I.C.R..... | 7 | 60.2 |
| Pacifique Houle..... | Duncan..... | I.C.R..... | 7 | 60.4 |
| N. Dufresne..... | Bagot..... | I.C.R..... | 7 | 60.5 |
| David Girard..... | Ste. Angèle..... | Q.M. & S..... | 8 | 60.5 |
| George Fournier..... | Montmagny..... | I.C.R..... | 5 | 60.6 |
| A. Davis..... | Piedmont..... | C.P.R..... | 3 | 60.6 |
| A. M. St. Cyr..... | La Perade..... | C.P.R..... | 3 | 60.6 |
| E. Riquette & Frère..... | Duncan..... | I.C.R..... | 7 | 60.8 |
| E. Decelles..... | Bagot..... | I.C.R..... | 6 | 60.8 |
| J. B. Sansregret..... | Lavaltrie..... | C.P.R..... | 5 | 60.8 |
| D. Houle..... | St. Germain..... | I.C.R..... | 4 | 60.8 |
| James Miller..... | Lisgar..... | G.T.R..... | 4 | 61.0 |
| S. Deslauriers..... | Danby..... | G.T.R..... | 2 | 61.0 |
| Omer Hardy..... | Daveluyville..... | I.C.R..... | 2 | 61.0 |
| H. Mailbiot..... | Daveluyville..... | I.C.R..... | 2 | 61.0 |
| A. Blanchet..... | St. Louis de B..... | Q.M. & S..... | 2 | 61.0 |
| Philemon Lebuis..... | St. Eustache..... | C.P.R..... | 5 | 61.0 |
| Amedé Gandreau..... | Trois Simons..... | I.C.R..... | 4 | 61.2 |
| Albert Houle..... | St. Simon..... | C.P.R..... | 8 | 61.2 |
| Charles E. Gravel..... | Lavaltrie..... | C.P.R..... | 6 | 61.3 |
| Joseph Gourie..... | L'Épiphanie..... | C.N.Q.R..... | 2 | 61.5 |
| E. Brosseau (E.B. 7)..... | Ste. Adèle..... | C.N.Q.R..... | 4 | 61.5 |
| D. D. Laurin..... | St. Janvier..... | C.P.R..... | 2 | 61.5 |
| J. E. Messier..... | Vercheres..... | Q.M. & S..... | 2 | 61.5 |
| Ed. Boulay..... | St. Vallier..... | I.C.R..... | 4 | 61.5 |
| L. J. A. Robillard..... | St. Georges..... | C.N.Q.R..... | 5 | 61.6 |
| N. Boucher..... | Charette Mills..... | C.N.Q.R..... | 3 | 61.6 |
| Charles Duquette..... | St. Hyacinthe..... | G.T.R..... | 4 | 61.7 |
| J. Meunier..... | Henryville..... | Q.M. & S..... | 5 | 61.8 |
| C. O. Savard..... | St. Vallier..... | I.C.R..... | 2 | 62.0 |

SESSIONAL PAPER No. 15a

AVERAGE TEMPERATURES OF BUTTER—Continued.

| Creamery. | Shipping Station. | Railway. | Number of Packages Tested. | Average Temper- ature. |
|----------------------|-------------------|--------------|-------------------------------------|------------------------------|
| | | | | Deg. |
| Frs. Dion | St. Charles Jet | I.C.R. | 3 | 62.0 |
| E. Thinelle | St. Lin. | C.P.R. | 2 | 62.0 |
| E. Brosseau | Piedmont. | C.P.R. | 1 | 62.0 |
| A. Brasseur | St. Pie. | C.P.R. | 4 | 62.0 |
| V. Gevry | St. Pie. | C.P.R. | 2 | 62.0 |
| M. Beauchesne | Danville | G.T.R. | 5 | 62.0 |
| W. Deshaies | Daveluyville. | I.C.R. | 2 | 62.0 |
| J. L. Janelle | Daveluyville | I.C.R. | 2 | 62.0 |
| J. A. Courchéne | Ste. Perpétue. | I.C.R. | 1 | 62.0 |
| Alp. Lacharite | Ste. Perpétue. | I.C.R. | 1 | 62.0 |
| J. Duval | Carmel. | I.C.R. | 1 | 62.0 |
| Eustache Menard | L'Anse a Giles | I.C.R. | 2 | 62.5 |
| J. O. Naud | Portneuf | C.P.R. | 2 | 62.5 |
| J. E. Grenier | St. Paulin. | C.N.Q.R. | 3 | 62.6 |
| P. A. Savoie | St. Eugene | I.C.R. | 5 | 62.6 |
| J. B. St. Pierre | Lesage | C.P.R. | 4 | 62.7 |
| J. A. Allaire | L'Epiphanie | C.N.Q.R. | 5 | 62.8 |
| A. Chagnon | Britannia Mill | G.T.R. | 5 | 63.0 |
| C. Lussier | Rangemont. | Q.M. & S. | 7 | 63.0 |
| Boisvert & Bussiere | Yamachiche | C.P.R. | 2 | 63.0 |
| Gregoire Belanger | Piedmont. | C.P.R. | 2 | 63.0 |
| H. Lacasse | St. Margaret. | C.P.R. | 1 | 63.0 |
| E. Brosseau (E.B. 6) | St. Jerome. | C.N.Q.R. | 4 | 63.0 |
| E. Brosseau (E.B. 4) | St. Jerome | C.N.Q.R. | 3 | 63.3 |
| Amedee Touchette | St. Pie | C.P.R. | 3 | 63.3 |
| T. Messier | Bagot | I.C.R. | 8 | 63.3 |
| D. Milot | Yamachiche | C.P.R. | 2 | 63.5 |
| Alfred Riencourt | St. Hyacinthe | G.T.R. | 2 | 63.5 |
| L. Benoit | St. Louis de B. | Q.M. & S. | 2 | 63.5 |
| Jos. Shaw | Lesage | C.P.R. | 2 | 63.5 |
| Societe de Fleury | St. Judes. | Q.M. & S. | 2 | 63.5 |
| Thomas Lacerte | Yamachiche. | C.P.R. | 8 | 63.6 |
| Jas. Robitoux | St. Roch | Q.M. & S. | 3 | 63.6 |
| Hector Lapalme | Abbotsford | C.P.R. | 4 | 63.7 |
| J. B. Beauchemin | St. Perpétue. | I.C.R. | 1 | 64.0 |
| Ovila Gendron | Yamachiche | C.P.R. | 7 | 64.2 |
| E. Brosseau (E.B. 5) | St. Jerome | C.N.Q.R. | 3 | 64.3 |
| Dubois Deshaies | Daveluyville. | I.C.R. | 2 | 64.5 |
| D. Legaré | Shawbridge | C.P.R. | 2 | 64.5 |
| J. B. Phaneuf | Centrecourt | Q.M. & S. | 2 | 65.0 |
| A. Bourgoin | Mascouche | C.P.R. | 2 | 65.5 |
| S. Boudier | St. Edouard | Nap. Jet. R. | 1 | 66.0 |
| Louis Martin | Drummondville | I.C.R. | 1 | 66.0 |
| W. Vezina | St. Basile | C.P.R. | 5 | 66.2 |
| Dionis Milot | Yamachiche | C.P.R. | 2 | 66.5 |
| N. Fournier | Manseau. | I.C.R. | 4 | 66.7 |
| Julien Beaudet | Parsville | L. & M. R. | 5 | 67.6 |
| A. Dupont | Danby | G.T.R. | 3 | 68.0 |
| Jos. Guilbault | Mascouche. | C.P.R. | 1 | 68.0 |
| H. Boireau | Yamachiche. | C.P.R. | 2 | 68.5 |

It will be noted that in 1903 the lowest average was 42.2 degrees and the highest 68.5 degrees. The comparison for the three previous years was as follows: 1907, 39.5 degrees and 68 degrees; 1906, 42.4 degrees and 68 degrees; 1905, 51.1 degrees and 67.7 degrees.

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TABLE No. 3.—AVERAGE TEMPERATURES OF BUTTER AT RAILWAY SHIPPING POINTS IN ONTARIO, SEASON 1903. (INSPECTOR L. L. COOKE.)

| Creamery. | Station. | No. of Packages Tested. | Average Temperature. Deg. |
|-------------------------|--------------|-------------------------|------------------------------|
| Holstein | Holstein | 4 | 47.5 |
| Walkerton Egg and Dairy | Fergus | 7 | 48 |
| Kennett | Fergus | 13 | 50 |
| Parsley | Parsley | 6 | 50 |
| Dunlop | McGee | 17 | 50 |
| Port Perry | Port Perry | 17 | 50 |
| Pleasant View | Owen Sound | 15 | 50 |
| Sturtevant | Sturtevant | 10 | 50 |
| Keweenaw | Keweenaw | 23 | 50 |
| Grand Valley | Grand Valley | 8 | 50 |
| Methu | Methu | 5 | 50 |
| Elliot | Lenoirville | 22 | 50 |
| Forest | Forest | 15 | 56.2 |
| Ayton | Ayton | 9 | 57 |
| Elmville | Elmville | 15 | 57 |
| Underwood | Port Elgin | 6 | 57.2 |
| Laurelton | Petrolia | 16 | 57.7 |
| Marbleton | Holston | 6 | 57 |
| New Dand | Petersburg | 15 | 57 |
| Baden | Baden | 3 | 58 |
| Glendale | Glendale | 7 | 58 |
| Tiverton | Kincardine | 6 | 58.2 |
| Exeter | Exeter | 8 | 58 |
| Sharnbrook | Centralia | 4 | 59 |
| Cedar Springs | Kennelton | 5 | 60 |
| Milvinton | Milvinton | 5 | 60 |
| Winchester | Exeter | 16 | 67 |
| Victoria Road | Lambton | 8 | 7 |

In 1907, we had only the average temperatures at shipping stations of butter from eight creameries, the lowest being 41.3 degrees and the highest 61.3 degrees. In 1903, as shown above, the lowest average temperature was 47.5 degrees and the highest 73.3 degrees, which is not such a good showing.

The following table shows the temperature of marked packages of dairy butter and of creamery butter both at shipping points and at Toronto. The packages that were tested by the inspector at the railway stations were marked by him so that he could pick them out and retest them when they were removed from the cars at Toronto.

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TABLE NO. 4.—TEMPERATURES OF ONTARIO BUTTER AT SHIPPING POINTS AND AT TORONTO, SEASON, 1908.

| | |
|---|-----------|
| <i>Dairy Butter Only.</i> | |
| Number of cars.. . . . | 7 |
| Number of packages tested at shipping points, marked and re- tested at Toronto.. . . . | 94 |
| Average temperature at shipping points.. . . . | 63.4 deg. |
| Average temperature at Toronto.. . . . | 56.9 " |
| <hr/> | |
| Reduction in temperature.. . . . | 6.5 " |
| <i>Creamery Butter Only.</i> | |
| Number of cars.. . . . | 7 |
| Number of packages tested at shipping points, marked and re- tested at Toronto.. . . . | 67 |
| Average temperature at shipping points.. . . . | 54.9 deg. |
| Average temperature at Toronto.. . . . | 49.9 " |
| <hr/> | |
| Reduction in temperature.. . . . | 5.0 " |

TABLE NO. 5.—TEMPERATURES OF ONTARIO BUTTER AT SHIPPING POINTS AND AT MONTREAL, SEASON, 1908.

| | |
|--|-----------|
| <i>Dairy Butter Only.</i> | |
| Number of cars.. . . . | 15 |
| Number of packages tested at shipping points, marked and re- tested at Montreal.. . . . | 113 |
| Average temperature at shipping points.. . . . | 64.8 deg. |
| Average temperature at Montreal.. . . . | 53.4 " |
| <hr/> | |
| Reduction in temperature.. . . . | 11.4 " |
| <i>Creamery Butter Only.</i> | |
| Number of cars.. . . . | 7 |
| Number of packages tested at shipping points, marked and re- tested at Montreal.. . . . | 49 |
| Average temperature at shipping points.. . . . | 57.7 deg. |
| Average temperature at Montreal.. . . . | 50.5 " |
| <hr/> | |
| Reduction in temperature.. . . . | 7.2 " |

Table No. 5 gives the temperature of marked packages of Ontario dairy butter and of Ontario creamery butter at Montreal. It will be observed that the dairy butter, taking the average of fifteen cars, was reduced in temperature 11.4 degrees during transit from Western Ontario points to Montreal, which must be regarded as a satisfactory showing and a tribute to the efficiency of the iced cars.

As already mentioned, the travelling inspectors when they test the temperature of butter at railway stations place a special mark on the packages so that these may be picked out and retested at Toronto or Montreal, according to the destination of the butter. In the following table the average temperatures at Montreal of these marked packages are shown for both Ontario and Quebec butter.

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TABLE No. 6.—TEMPERATURES OF ONTARIO AND QUEBEC BUTTER AT SHIPPING POINTS AND AT MONTREAL, SEASON 1908.

| | No. of cars with marked packages. | No. of marked packages tested at shipping points and at Montreal. | Average temperature at shipping points. | Average temperature at Montreal. | Increase in temperature. | Reduction in temperature. |
|--|-----------------------------------|---|---|----------------------------------|--------------------------|---------------------------|
| | | | Deg. | Deg. | Deg. | Deg. |
| Ontario via G.T.R. | 15 | 154 | 60·2 | 51·8 | ..... | 8·4 |
| " " P.M. | 1 | 8 | 65·6 | 59·5 | ..... | 6·1 |
| Quebec (north of St. Lawrence) via C.P.R. | 10 | 197 | 57·1 | 55·8 | ..... | 1·3 |
| Quebec (south of St. Lawrence) via C.P.R. | 34 | 404 | 50·5 | 51·3 | 0·8 | ..... |
| Quebec via G.T.R. | 15 | 185 | 54·4 | 57·2 | 2·8 | ..... |
| " " I.C.R. | 9 | 130 | 55·6 | 56·1 | 0·5 | ..... |
| " " Q.C.R. | 2 | 35 | 55·2 | 55·4 | ..... | 0·8 |
| " " C.V.R. | 5 | 52 | 52·5 | 54·8 | 2·3 | ..... |
| " " Q.M.&S. | 5 | 69 | 58·0 | 56·6 | ..... | 1·4 |
| " " C.N.Q.R. | 5 | 47 | 54·4 | 52·8 | ..... | 1·6 |
| " " L.&M. | 2 | 9 | 54·1 | 58·5 | 4·4 | ..... |
| Totals..... | 103 | 1,290 | | | | |
| General Average. | | | 54·9 | 54·4 | ..... | 0·5 |
| Season 1907, general average | | | 51·3 | 50·5 | ..... | 0·8 |
| " 1905, " | | | 52·6 | 53·2 | 0·6 | ..... |
| " 1905, " | | | 54·4 | 54·5 | 0·1 | ..... |

THE EXPORT BUTTER TRADE.

In the year ended March 31, 1908, the quantity of butter exported amounted to 4,786,954 pounds valued at \$1,068,703. In the year ended March 31, 1909, the exports were 6,326,355 pounds, worth \$1,521,436. The total receipts at Montreal from May 1, 1908, to the close of navigation amounted to 446,959 packages as compared with 391,099 packages the previous season. In 1908, the exports from Montreal were 93,766 packages and in 1907, 66,896 packages. All the butter exported the past season was carried in cold storage at a suitable temperature and was landed in good condition.

The following table shows the comparative temperatures for the past four years of butter when delivered to the steamers at Montreal and when unloaded at the port of discharge in Great Britain.

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TABLE No. 7.

| | No. of Packages Tested. | Average Temperature at Montreal. | Average Temperature at Port of Discharge. | Average Reduction in Temperature by Ships' Refrigerators. |
|-------------------------|-------------------------------|---|---|---|
| | | Deg. | Deg. | Deg. |
| Montreal to Liverpool— | | | | |
| Season 1905..... | 843 | 39·3 | 24·9 | 14·4 |
| " 1906..... | 456 | 39·2 | 21·4 | 17·8 |
| " 1907..... | 183 | 33·7 | 23·1 | 10·6 |
| " 1908..... | 86 | 37·5 | 25·0 | 12·5 |
| Montreal to London— | | | | |
| Season 1905..... | 859 | 40·2 | 26·6 | 13·6 |
| " 1906..... | 527 | 41·7 | 20·5 | 21·2 |
| " 1907..... | 217 | 36·2 | 15·3 | 20·9 |
| " 1908..... | 153 | 39·6 | 18·2 | 21·4 |
| Montreal to Bristol— | | | | |
| Season 1905..... | 607 | 36·9 | 23·9 | 13·0 |
| " 1906..... | 361 | 36·9 | 23·9 | 13·0 |
| " 1907..... | 186 | 35·4 | 22·9 | 12·5 |
| " 1908..... | 226 | 35·3 | 23·5 | 11·8 |
| Montreal to Glasgow— | | | | |
| Season 1905..... | 403 | 35·8 | 28·7 | 7·1 |
| " 1906..... | 374 | 35·0 | 24·1 | 10·9 |
| " 1907..... | 183 | 35·9 | 19·2 | 16·7 |
| " 1908..... | 75 | 35·0 | 23·9 | 11·1 |
| Montreal to Manchester— | | | | |
| Season 1905..... | 87 | 34·4 | 30·4 | 4·0 |
| " 1906..... | 33 | 41·2 | 38·8 | 2·4 |
| " 1907..... | 7 | 40·9 | 34·0 | 6·9 |
| " 1908..... | | | | |

THE EXPORT CHEESE TRADE.

The bulk of the cheese received at Montreal for export during the shipping season arrived in good condition. Between eleven and twelve hundred iced cars were used by the shippers, on which the icing charges to the extent of \$5 per car were paid by this department. Not all the cheese, however, received at Montreal during the hot weather was transported in iced cars, although one would imagine that every shipper would be willing to expend the small sum of \$5, the cost of two tons of ice, in order to provide against risk of injury to goods worth in the neighbourhood of \$3,000. In a good many instances cheese were loaded in refrigerator cars which were not iced and, as a consequence, the warm air which was in the car when loaded and whatever heat had been generated by the goods while in transit, was bottled up without any means of escape. When it is not intended to use ice it is much better to ship in an ordinary box car than in a refrigerator; but we wish to emphasize the fact that during the hot months iced cars should be used whenever it is possible to obtain them.

According to the Board of Trade returns, 1,961,006 boxes of cheese were received at Montreal during the season of navigation; the total exports from that port amounting to 1,791,005 boxes.

Following are the figures showing the quantity and value of cheese exported from Canada in the years ending March 31, 1904 to 1909, inclusive:—

| Year ended March 31. | Lbs. | Value. |
|----------------------|-------------|------------|
| | | \$ |
| 1904..... | 242,432,366 | 25,975,998 |
| 1905..... | 216,080,606 | 19,969,363 |
| 1906..... | 214,433,960 | 23,679,419 |
| 1907..... | 213,614,643 | 26,160,856 |
| 1908..... | 189,710,463 | 22,887,237 |
| 1909..... | 164,907,139 | 20,334,666 |

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As the reports of cargo inspectors in Great Britain and the letters from British importers, which are published in this report, refer particularly to the quality and condition of Canadian cheese imported into Great Britain in 1908, I will not go into the question here beyond pointing out the remarkable unanimity with which the importers state that they received no heated cheese last season, or else such a small quantity as to be practically unnoticeable. This is a splendid record in view of the fact that the weather conditions were aggravated during September and October by smoke from the forest fires which detained cheese cargoes in the River St. Lawrence for days at a time, during a period of unusually warm weather. It is difficult to estimate the additional revenue received last year on account of the fine condition in which Canadian cheese were delivered on the other side, but it must have reached a very large sum. In the letters referred to, the principal complaints relate to the shipping of green cheese; short-weights; indistinct marking of weights on boxes; lack of care in boxing cheese, and the use (by Quebec factorymen especially) of inferior boxes. The complaints *re* indistinct marking and the use of boxes which do not fit the cheese crop up year after year, and it seems impossible to eradicate these faults, which no doubt appear trivial to the cheese-maker, but which in the aggregate cause a lot of loss and inconvenience to the trade. To stencil the weights neatly on the boxes entails little extra work at the factory, but it saves a lot of trouble when the cheese are collected at the importer's warehouse in Great Britain. In the same way, if all our cheese were carried in snug fitting boxes, it would reduce breakage by 75 per cent, even with the poor class of boxes now in use. The grievance regarding short-weights (which includes the natural shrinkage) is a much more difficult one to handle, but if resolutely grappled with, I have no doubt that a solution of the difficulty could be obtained.

THE EXPORT APPLE TRADE.

The following table shows the quantity and value of apples shipped in the years ended March 31, 1904, to 1909, inclusive:—

| Year ended March 31. | Brls. | Value. |
|----------------------|-----------|-----------|
| | | \$ |
| 1904..... | 1,577,285 | 4,529,500 |
| 1905..... | 997,488 | 2,551,474 |
| 1906..... | 1,280,789 | 4,217,704 |
| 1907..... | 998,618 | 2,702,623 |
| 1908..... | 1,629,400 | 4,823,645 |
| 1909..... | 1,092,090 | 2,804,282 |

CONDITION OF APPLES EXPORTED.

The total shipments through the port of Montreal for the season of 1908 amounted to 325,821 barrels and 22,152 cases, compared with 626,113 barrels and 19,527 cases in 1907. The early apples which went forward during August and the first week of September were landed on the other side in good condition and realized satisfactory prices; but the shipments which reached the Liverpool and Glasgow markets after September 30, were delivered in very poor condition, with the result that the market went to pieces and extremely low prices prevailed. By October 20 the out-of-condition fruit was disposed of and as the apples then arriving were in good condition, the market recovered and good prices were realized during the remainder of the season. Generally speaking, the shipments which were landed in the old country in bad condition had been heated before they reached Montreal. As evidence of this I submit the following statement showing the condition of apples when loaded at

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Montreal on eight steamers, viz., the *Ottawa*, *Virginian*, *Tunisian*, *Marina*, *Athenia*, *Pretorian*, *Hesperian* and *Lakonin*, which sailed from Montreal for Liverpool and Glasgow between September 17 and October 3.

| | Barrels. |
|--|----------|
| Quantity of apples carried in these eight steamers.. . . . | 58,564 |
| Lots examined by fruit inspectors represented.. . . . | 51,477 |
| Approximate number either showing decay or at a temperature of 70 degrees and over.. . . . | 28,753 |

Fifty-three per cent of the apples carried by these eight boats was therefore in poor condition when loaded at Montreal, representing on the total quantity carried 32,210 barrels. Estimating the reduction in price obtained in Liverpool and Glasgow on account of the condition of the fruit at \$1.50 per barrel, it would mean a net loss on the shipments in question amounting to \$48,315.

Extremely hot weather in September and October was responsible for the trouble in 1908 just as it was in 1906, and in both years Ontario apple shippers dropped many thousands of dollars. The greater part of the loss made in these two years could have been prevented if the apples had been placed in cool storage as soon as picked and then carried to the shipping port in iced cars. If no provision is made for cool storage in the districts where the apples are grown, it is useless to expect that we shall be free from disastrous shipping seasons similar to those of 1906 and 1908.

SHIPMENTS FROM HALIFAX.

A cargo inspector was employed at the port of Halifax during the apple shipping season of 1908-9, and I quote the following extracts from his final report:—

‘At Halifax the steamship companies do their own handling, taking the apples from the cars, rolling them to the hatchways and hoisting them into the holds in the steamers, six barrels at a time. I found the handling and stowing very satisfactory, seldom having to speak to the men for rough handling. We have had some trouble with large cars, which are usually loaded five barrels high. In letting the barrels down, the top row is sometimes bound to strike very hard on the ends, making the fruit slack in the barrels. I have been in the cars and have assisted in lowering the top tier and find it almost impossible to let the barrels down easily. In my opinion shippers should positively refuse to load these cars more than four barrels high.

‘The Dominion Atlantic Railway carries most of the apples from the packing houses to the railway yard in Richmond, the Intercolonial Railway taking them there and placing them alongside the steamers. This work has been done satisfactorily. Up to April 1, the Dominion Atlantic Railway used 2,334 cars to move the apple crop of 1908. There are about fifty cars more in the valley, making a total of 2,384 cars.

‘The apples were mostly shipped in ordinary stowage in the steamships, one shipment of 2,123 barrels, 2,060 half barrels and 517 boxes going forward in cold storage on the s.s. *Canada Cape* to South Africa. This was the only shipment of perishable produce from this port in cold storage this season.’

THERMOGRAPHS PLACED AT HALIFAX.

During the season of 1908-9, thermographs were placed in the following steamers:—

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| Steamer. | Destination. | Date Placed. | No. Placed. |
|--------------------|--------------------|----------------|-------------|
| Rappahannock. | London. | Sept. 12. | 2 |
| Kanawha. | " | " 19. | 2 |
| Tabasco. | " | " 26. | 2 |
| Shenandoah. | " | Oct. 3. | 2 |
| Almeriana. | " | " 13. | 2 |
| Rappahannock. | " | " 24. | 2 |
| Kanawha. | " | Nov. 3. | 2 |
| Tabasco. | " | " 11. | 2 |
| Shenandoah. | " | " 19. | 2 |
| Almeriana. | " | " 27. | 2 |
| Rappahannock. | " | Dec. 3. | 2 |
| Tabasco. | " | " 25. | 2 |
| Shenandoah. | " | Jan. 6. | 2 |
| London City. | Liverpool. | " 13. | 1 |
| Rappahannock. | London. | " 14. | 2 |
| Kanawha. | " | " 22. | 1 |
| Corsican. | Liverpool. | " 23. | 1 |
| Canada Cape. | South Africa. | Oct. 6. | 1 |
| Total ..... | ..... | ..... | 32 |

Satisfactory temperatures were recorded by these thermographs, showing that these boats have good ordinary ventilation.

SHIPMENTS OF APPLES FROM HALIFAX, BY PORTS, SEASON 1908-9.

| Port. | Barrels. | Half Barrels. | Boxes. |
|-------------------------------|----------|---------------|--------|
| London. | 296,661 | 319 | 1,478 |
| Liverpool. | 150,724 | 79 | 1,054 |
| Glasgow. | 45,986 | ..... | ..... |
| St. John's, N'f'd. | 12,962 | 69 | 3 |
| Manchester. | 10,873 | ..... | ..... |
| Bernada and West Indies. | 5,129 | ..... | ..... |
| South Africa. | 2,123 | 2,060 | 517 |
| New York. | 1,005 | ..... | ..... |
| Total | 525,463 | 2,527 | 3,052 |

In addition to the foregoing about 50,000 barrels of Nova Scotian apples were purchased by the cold storage company at St. John and shipped from that port during the winter months. About 10,000 barrels were also shipped to the United States via Yarmouth. If we add to these figures the apples sold on the local markets, extending from Prince Edward Island to Montreal, estimated at about 90,000 barrels, it brings the total crop placed on the markets to the handsome figure of 675,463 barrels.

SHIPMENTS FROM ST. JOHN, N.B.

During the season from November, 1908, to March, 1909, the total shipments of apples through the port of St. John, N.B., amounted to 76,906 barrels and 3,253 boxes. Of this quantity 14,030 barrels and 1,224 boxes were forwarded in cold storage.

ACKNOWLEDGMENTS.

In concluding this report I wish to express my appreciation of the manner in which the inspectors, employed under the direction of this division during the past year, have performed their duties.

I have the honour to be, sir,

Your obedient servant,

W. W. MOORE,
Chief, Markets Division.

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

FOR THE

FISCAL YEAR ENDING MARCH 31,

1909.

PART IV.—FRUIT DIVISION.

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Enforcement of Inspection and Sale Act, Part IX.—The Fruit Crop Report—Fruit Season of 1908 in Canada—Evaporated Apples—South African Trade—Fruit for the Franco-British Exhibition—Early Apple and Tender Fruit Trade—Imported Fruit—The Northwest Market—Fruit Meetings—Miscellaneous Work.

PART IV.—FRUIT DIVISION.

J. A. RUDDICK, Esq.,
Commissioner of Dairying and Cold Storage,
Ottawa.

SIR,—I have the honour to submit a report of the work of the Fruit Division for the year ending March 31, 1909, under the following heads:—

- (1) The enforcement of the Inspection and Sale Act, Part IX.
- (2) The publication of the Fruit Crop Report.
- (3) The fruit season of 1908 in Canada.
- (4) Evaporated Apples.
- (5) South African Trade.
- (6) Fruit for the Franco-British Exhibition.
- (7) Early Apple and Tender Fruit Trade.
- (8) Imported Fruit.
- (9) The Northwest market for early apples.
- (10) The Quality of Winter Apples shipped to the Northwest.
- (11) Fruit Meetings.
- (12) Miscellaneous Work.

THE ENFORCEMENT OF THE INSPECTION AND SALE ACT, PART IX.

THE STAFF OF INSPECTORS.

There were few changes in the personnel of the Dominion fruit inspectors during the year. Mr. W. J. Furminger, of St. Catharines, was appointed to work more particularly in southern Ontario. Mr. W. J. Bryan, of Lucknow, was appointed to work in western Ontario, and Mr. Earl Moore, of Oshawa, was appointed to work on the docks at Montreal during the shipping season, and, later, in the warehouses on the north shore of Lake Ontario. Owing to the death of Mr. J. J. Philp, Mr. W. W. Brown was sent to Winnipeg, and remained there during the season. The staff consists of nine permanent inspectors and twelve temporary inspectors.

THE WORK OF THE SEASON.

No particular difficulties presented themselves this season. Speaking generally, the apples were packed much better than for the season of 1907-8, and, consequently, fewer violations of the Inspection and Sale Act were discovered. Merchants in Great Britain have, almost without exception, expressed their satisfaction with the pack this season. The Northwest trade was not so satisfactory, although there has been some improvement. The fact remains, however, that many shippers are not nearly so careful with reference to the grading of fruit for the Northwest trade as they are for the export trade. A large number of prosecutions originated in the examinations which were made by the inspectors travelling in Manitoba, Saskatchewan and Alberta.

INSPECTION STATISTICS.

A larger percentage of inspectors were detailed this year to work in orchards and at the point of shipment. This, while quite satisfactory in some respects, does

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not give an opportunity for inspecting as many packages as if the inspectors were placed where the fruit is concentrated in the large markets and at the export points. In order to show the scope of the work more fully, the varieties of fruit have been divided in the following table, and the statistics given for each variety. It is to be noted that the apples, both in boxes and barrels, and the pears, were very largely for export, the other varieties of fruit practically all for domestic consumption.

| Variety. | No. of lots inspected. | No. of pkgs. in lots inspected. | No. of pkgs. inspected. |
|--------------------|------------------------|---------------------------------|-------------------------|
| Apples (bbls)..... | 5,940 | 682,657 | 42,223 |
| " (boxes)..... | 248 | 100,729 | 2,701 |
| Pears..... | 88 | 54,150 | 7,924 |
| Peaches..... | 91 | 140,976 | 16,005 |
| Plums..... | 54 | 16,505 | 1,474 |
| Tomatoes..... | 53 | 11,381 | 779 |
| Early fruits..... | 863 | 1,184,651 | 154,874 |
| Total..... | 7,337 | 2,191,049 | 225,980 |

PROSECUTIONS.

An endeavour was made this year to make the prosecutions as promptly as possible. This entailed the taking away of some of the inspectors from the work of inspection for part of the shipping season. The total number of convictions this season has been eighty. The names and addresses of the persons convicted under the Inspection and Sale Act, Part IX., for the season 1908-9, are given below.

| Name. | Address. |
|---------------------------|--------------------------------------|
| Arthur Alyea.. .. . | Brighton, Ont. |
| Orbey Alyea.. .. . | Trenton, Ont. |
| J. H. Barry.. .. . | Meaford, Ont. |
| J. A. and E. Brown.. .. . | Port Hope, Ont. |
| J. A. and E. Brown.. .. . | Port Hope, Ont. (second conviction). |
| Jas. Caesar.. .. . | Langside, Ont. |
| Duncan Cameron.. .. . | Ripley, Ont. |
| D. Cantelon.. .. . | Clinton, Ont. |
| B. Churchill.. .. . | Clinton, Ont. |
| Coyle and Floyd.. .. . | Colborne, Ont. |
| Coyle and Floyd.. .. . | Colborne, Ont. (second conviction) |
| B. H. Coyle.. .. . | Colborne, Ont. |
| John Coyle.. .. . | Colborne, Ont. |
| John Coyle.. .. . | Colborne, Ont. (second conviction). |
| John Coyle.. .. . | Colborne, Ont. (third conviction). |
| John Denholm.. .. . | Blyth, Ont. |
| C. R. Denike.. .. . | Green Point, Ont. |
| J. P. Dunn.. .. . | Streetsville, Ont. |
| Robert Elliott.. .. . | Goderich, Ont. |
| Robert Elliott.. .. . | Goderich, Ont. (second conviction). |
| R. R. Elliott.. .. . | Goderich, Ont. |
| R. R. Elliott.. .. . | Goderich, Ont. (second conviction). |
| W. A. Fraser.. .. . | Trenton, Ont. |
| G. W. French.. .. . | Colborne, Ont. |
| G. W. French.. .. . | Colborne, Ont. (second conviction). |
| Angus Galbraith.. .. . | Parkhill, Ont. |
| S. P. Herrington.. .. . | Brighton, Ont. |
| J. M. Hodgins.. .. . | South Bay, Ont. |
| A. E. Hoover.. .. . | Selkirk, Ont. |
| John Joynt.. .. . | Lucknow, Ont. |
| John Joynt.. .. . | Lucknow, Ont. (second conviction). |
| Wm. Little.. .. . | Teeswater, Ont. |
| H. McQuillan.. .. . | Lucknow, Ont. |
| H. McQuillan.. .. . | Lucknow, Ont. (second conviction). |
| Geo. Miles.. .. . | New Durham, Ont. |

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| Name. | Address. |
|--|---|
| T. Mirehouse.. | Whitechurch, Ont. |
| F. G. Monet.. | Langside, Ont. |
| R. G. Monet.. | Port Perry, Ont. |
| L. F. Sheldgrove.. | Brighton, Ont. |
| Jas. Steep.. | Clinton, Ont. |
| I. Temple.. | Ancaster, Ont. (prosecuted by A. C. Caldwell, Dundas). |
| Arthur Terrill.. | Wooler, Ont. |
| Robert Thompson.. | Brussels, Ont. |
| Frank White.. | Bloomsburg, Ont. |
| John Wilson.. | Ingersoll, Ont. |
| R. A. Webber.. | Hickson, Ont. |
| Chas. Watts.. | Thamesville, Ont. |
| J. R. Clogg & Co.. | Montreal, P.Q. |
| A. Lortie.. | Verte Vallée, P.Q. |
| L. A. Armstrong.. | Falmouth, N.S. |
| Aylesford Fruit & Produce Co.. | Aylesford, N.S. |
| G. W. Beckwith.. | Sheffield Mills, N.S. |
| J. W. Bigelow.. | Wolfville, N.S. |
| F. C. Bill.. | Northville, N.S. |
| Frank Cogswell.. | Lakeville, N.S. |
| E. S. Condon.. | Grafton, N.S. |
| A. Curry.. | Falmouth, N.S. |
| C. M. & W. S. Dewitt.. | Blomidon, N.S. |
| A. H. Dickie.. | Upper Canard, N.S. |
| F. W. Dickie.. | Canard, N.S. |
| H. O. Duncanson.. | Falmouth, N.S. |
| E. J. Ells.. | Sheffield Mills, N.S. |
| P. W. Ells.. | Sheffield Mills, N.S. |
| F. L. Gertridge.. | Gasperaux, N.S. |
| V. Greene.. | Blomidon, N.S. |
| R. E. Harris & Son.. | Wolfville, N.S. |
| R. E. Harris & Son.. | Wolfville, N.S. (second conviction). |
| A. J. Kinsman.. | Centerville, N.S. |
| M. Lockwood.. | Canning, N.S. |
| C. McLellan.. | Avon Valley, N.S. |
| H. Oiler.. | Kentville, N.S. |
| C. A. Patriquin.. | Wolfville, N.S. |
| Robt. W. Reid.. | Centerville, N.S. |
| C. B. Sheffield.. | Upper Dyke, N.S. |
| A. E. Skerry.. | Billtown, N.S. |
| A. W. Slocomb.. | Mt. Handley, N.S. |
| E. W. Trenholm.. | Grand Pré, N.S. |
| S. Warner.. | Prince Albert, NS. |
| M. Whitman.. | Brooklyn, N.S. |
| B. Woodworth.. | Church St., N.S. |

AMENDMENTS TO THE ACT.

The amendments to the Inspection and Sale Act, Part IX., which were passed by parliament during the session of 1907-8 have been an undoubted improvement. These changes consisted in a clearer definition of the No. 2 grade, a definition of cull fruit and a provision for imposing heavier penalties.

NO. 2 GRADE.

In the practical working out of this grade, conditions arose which had not been foreseen by those who framed the original definition. According to that definition, a barrel of No. 2 apples must contain specimens not less than nearly medium in size and must be eighty per cent free from wormholes and other defects that cause material waste. The part of the definition which was found weak was that referring to the twenty per cent of the fruit in the package which might consist of absolute trash, provided it met the requirementst of the clause designating size. Large percentages of inferior fruit were deliberately included by unscrupulous packers, who made no attempt to follow the spirit of the law, but intentionally put in the limit of defects as was permitted by the 20 per cent clause. It was not uncommon to find one-fifth of the fruit in No. 2 barrels nothing but 'culls.' To make matters

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worse, these culls were often diseased and contaminated the good fruit in the barrel, so that after a short time the whole was worthless. This was manifestly unfair to those who followed the intention of the definition and packed only merchantable fruit. This weakness was removed by inserting the words 'includes no culls' in the definition. Clause (iii) of subsection (b), section 321, now reads:—

'No 2 quality, unless such fruit *includes no culls* and consists of specimens of not less than nearly medium size for the variety, and not less than eighty per cent free from worm-holes and such other defects as cause material waste, and properly packed.'

DEFINITION OF CULLS.

In order to fully establish the practical working of the amended definition of the No. 2 grade 'culls' were defined as fruit 'that is either very small for the variety, or immature, or the skin of which is broken so as to expose the tissue beneath, or that is so injured by insects, fungi, abnormal growths, or other causes, as to render it unmerchantable.'

EFFECT ON THE NO. 2 GRADE.

If packages of fruit bearing the grade mark 'No. 2' are offered for sale containing a percentage of culls deliberately included, which when mixed through the package lower the quality and detract from the appearance and serviceableness of the package, the packer responsible is now liable to a fine. The result is that the No. 2 grade is now good, serviceable stock, suitable for all culinary purposes and quite acceptable for ordinary family use to eat out of hand. Every specimen may be defective, but none to such an extent as to cause material waste. This grade is now taken freely in the Northwest and in the British markets, but only when it is strictly up to grade. The No. 2 grade will include 60 to 75 per cent of the average Canadian stock after culls have been rejected. Properly sprayed orchards do not show more than 10 or 15 per cent of No. 2 fruit, and often less.

PENALTIES.

The original penalties, which ranged from a minimum of 25 cents to a maximum of \$1, were found to be an insufficient deterrent. The amended section referring to penalties now reads:—

'328. Every person who, by himself or through the agency of any other person, violates any of the provisions of section 320 and 321 of this Act, shall be liable, for the first offence, to a fine not exceeding \$25 and not less than \$10; for the second offence, to a fine not exceeding \$50 and not less than \$25; and for the third and each subsequent offence, to a fine not exceeding \$200 and not less than \$50, together, in all cases, with the costs of prosecution; and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding one month, unless such fine and costs, and the costs of enforcing them, are sooner paid.

2. Whenever any such violation is with respect to a lot or shipment consisting of fifty or more closed packages, there may be imposed, in addition to any penalty provided by this section, for the first offence twenty-five cents, for the second offence fifty cents, and for the third and each subsequent offence one dollar, for each closed package in excess of fifty with respect to which such violation is committed.'

Deliberate offenders of these regulations will now have to face a heavy fine for every violation. Convictions will be counted from year to year. On another page in this report will be found a list of packers who have been fined this season. In some cases two and in one case three convictions have been registered. Should any of these packers be convicted next year under the Act, they will, of course, be subject

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to the penalties for a second or third offence. Consequently none on this list will be fined less than \$25, and all who have been fined twice this year will be subject to a fine of not less than \$50 next year.

ENFORCEMENT OF THE ACT WITH REFERENCE TO PACKAGES.

There was little or no complaint with reference to barrels and boxes. The law is now generally observed, and Canada is in the happy position of having a uniform system of fruit packages from the Atlantic to the Pacific. Each year a warning with reference to the requirements of the Act is issued to the manufacturers. The result is that, with the exception of a few strawberry boxes, so far as is known, there were no violations of the Act during the past season. The Nova Scotian apple growers continue to use the minimum size of barrel, while the Ontario and Quebec shippers, for the most part, use a size six or eight quarts larger. There is a growing tendency on the part of the Ontario shippers to reduce the size of the barrel to the minimum.

FINE DISTINCTIONS NOT RECOGNIZED IN GRADE DEFINITIONS.

The grades, 1 and 2, admit of a somewhat wide difference in quality. In size a No. 1 fruit can vary from medium to large and very large; in colour, from fair to excellent and extra good. These differences alone would give several classes of fruit, often, indeed usually, all present in a barrel of No. 1's. The value will vary just as one class or the other predominates and also with the wants of the customer.

PRICES VARY WITH CONDITION OF FRUIT.

This will account in part for the difference between the prices of different lots of grade No. 1; but the greatest difference is in the condition of the fruit. One lot will arrive sound and perfect; another originally as good, of the same grade, will arrive in a poor condition, heated, wilted, and perhaps showing signs of incipient decay. Only an examination of each lot can determine the condition and class.

FURTHER DEFINITIONS MAY BE DESIRABLE FOR BOX PACKING.

When our fruit packers become more skilled in grading and learn to put only apples of the same size, colour and quality in a package, we shall then have to distinguish between different classes even in Grade No. 1.

One of the values of box packing is its incentive to greater discrimination in grading. The best box packers grade so that every apple in a box is the same in size, colour, quality and condition, and these different qualities are all marked on the box. The size is marked by giving the number of tiers and the number of apples in the package. The colour is marked by an initial, as 'R' for red and 'L' for light. The general grade is indicated by Fancy, No. 1 and No. 2, as set forth in the Inspection and Sale Act. The definitions of the Act are broad because they are applied over the whole Dominion and are binding on the unskilled packer as well as the trained expert. To have made fine distinctions in grading would have been a great handicap to the larger number of apple growers who are not experts in packing.

IMPROVEMENT DEPENDS ON EDUCATION RATHER THAN LEGISLATION.

The Inspection and Sale Act has done a great work in bringing the Canadian apple trade to its present enviable position; but further advances will depend largely on the education of the individual grower and a change in the system of selling the fruit. This can hardly be a subject for legislation, except indirectly. The Inspection and Sale Act cannot be made more stringent at the present time, though the enforcement of it as it now stands should be as stringent as the conditions admit.

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RECOMMENDATIONS TO THE PACKER.

Of the changes that can be recommended to the individual grower, I know of none that would tend to improve the grading so much as using boxes instead of barrels for No. 1 fruit. A grower cannot use boxes long before he discovers that only one class of fruit should go into a particular package, and he soon discovers also that several classes could be made all in grade No. 1. For instance, all apples from $4\frac{1}{2}$ tier to $2\frac{1}{2}$ would be No. 1 in point of size; but each size would go in a separate package, marked so as to show the number of apples in the box. This alone would make four or five classes of apples all No. 1. A distinction would be made also in colour so as to make a further discrimination in class No. 1. It will be seen how crude is the present system of barrel packing, and why different samples of No. 1, all in equally good condition, may command widely different prices.

MORE BOXES ARE BEING USED.

A reference to the figures showing the quantity of fruit exported from Montreal, indicates that the number of boxes is increasing relatively. It is not too much to expect that ultimately a great part of No. 1 apples, though not all, will be shipped in boxes.

ITINERANT APPLE BUYERS WILL NOT USE BOXES.

This is not likely to come about so long as the present system of itinerant buyers is continued. It is impossible for them to handle both boxes and barrels, from the mere inconvenience of having two kinds of packages. They cannot secure and keep labour sufficiently skilled to pack boxes. And more important than all, they cannot secure sufficient control over the same kinds and varieties to obtain a reputation that will secure the advanced price that the greater skill, care and quality would demand. Box-packing, therefore, is not likely to be practised except by co-operative societies, and, therefore, for this and other reasons, improvement in grading and packing and in the actual growing of fruit is likely to go hand in hand with the organization of these societies.

FRUIT CROP REPORTS.

The fruit crop reports were continued during the year and the usual appreciation of them was expressed by the fruit growers. The number of correspondents was somewhat increased, and a large number of those who had not answered promptly were cut off the list. Still further efforts will be made to balance the number of correspondents with the amount of fruit being grown in each district, so as to render the summaries as accurate as possible. The system of reporting the fruit crop by districts receives the approbation of fruit men generally. It enables those interested, both growers and buyers, to estimate the quantity of fruit of the same kind and such as is grown under similar conditions, and so forms a much more trustworthy guide, both to the buyer and to the seller, than if the reports were made for whole provinces or large areas only.

COUNTY REPORTS.

Owing to our office arrangements, the Fruit Division is able to report without difficulty upon any particular county as well as upon the districts. This is a feature that is of very great assistance to the buyers in enabling them to locate fruit. It is an equal advantage, of course, to the growers.

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THE FRUIT SEASON OF 1908 IN CANADA.

As a fruit season, 1908 will stand out as much above the average. The crops of the various fruits, all things considered, were good. Market conditions were favourable and, notwithstanding certain drawbacks, there were no great impediments in reaching the consumer.

WEATHER CONDITIONS.

The weather conditions were, upon the whole, favourable. The fruit trees of all kinds came through the winter of 1907-8 with little or no injury. Perhaps the only losses for which the weather was responsible were in the storehouses in Nova Scotia, as the result of the excessive moisture and high temperature. Rots, moulds and fungous diseases generally developed abnormally and are accountable for a serious lowering in the reputation of the Nova Scotia fruit in the British markets.

NO WINTER KILLING, 1907-8.

No killing back was reported, and the injuries from mice and rabbits were much below the average. The spring was cool, but not cold. Bloom was, perhaps, a week later than usual, but the warm humid weather the middle of May caused a very rapid development of leaf and bloom, so that vegetation showed no signs of a late spring after growth had well started.

SLIGHTLY DRY FOR SMALL FRUITS.

The conditions for small fruits were quite favourable throughout May, but during the early part of June dry weather set in in eastern Canada, which shortened the crop somewhat, especially in Ontario. About June 20, local showers improved the situation.

STORMS.

There were a few serious storms that did some damage, especially one occurring on June 19, in the neighbourhood of St. Catharines. Light frosts were reported over a large area in Ontario on the 15th of the month, but no damage was done to fruit. Conditions continued favourable in July, though the first part of the month was somewhat dry.

SEPTEMBER AND OCTOBER TOO WARM FOR APPLES.

The June 'drop' was somewhat heavier than normal, and small fruits were shortened somewhat. The dry hot weather perhaps injured the valley regions of British Columbia slightly. The temperature was especially high for August, and the rainfall quite sufficient for good growth and the distribution very even. In southern Ontario the hot, humid atmosphere developed rot in early peaches, but otherwise did no serious damage, except that the conditions were favourable for the development of fungous diseases, which up to this time were scarcely perceptible. The growth of fungus was checked by the dry weather of September. Indeed, the most unfavourable weather of the season occurred during the month of September and the early part of October. The excessively high temperature ripened all fruits very rapidly, so as to force stock on the local markets faster than it could be consumed. The keeping qualities of tree fruits were seriously affected by rapid growth and over-ripening, and there were serious losses in the latter part of September and the first part of October to shippers of early apples, pears and peaches. Later conditions improved materially.

PINK ROT VERY PREVALENT.

Fungous diseases, particularly pink rot, along with the excessive heat, seriously damaged nearly all early shipments, both to the Northwest and for export. The latter part of October and November were ideal months for harvesting and shipping fruits.

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Shipments to the Northwest were larger than in any previous year, but the grave criticisms that were made were traceable to some extent to the unfavourable weather during September and October.

WINTER APPLES STORED.

Less than the usual quantity of apples were stored in the warehouses of Ontario. All apples suitable for winter trade were stored both in Ontario and Nova Scotia. The amount stored in Ontario was much less than usual, on account of the short crop of winter apples. But the weather during the winter was quite favourable for shipments, so that few losses are reported from freezing in transit or from other causes. The Nova Scotian storehouses were also fortunate and very few losses have been reported as the result of weather conditions.

THE APPLE CROP.

The apple still continues to be the largest feature of the Canadian fruit trade. Nova Scotia harvested the largest crop in its history. There were exported through Halifax 527,925 barrels of apples, all of which was the product of Nova Scotia. Taking the local consumption and the quantities supplied to the domestic markets, the total crop must have reached about six hundred thousand barrels.

EXPORTS FROM ST. JOHN VALLEY, N.B.

The St. John Valley exports a small quantity of apples, principally three varieties, the Duchess or Newbrunswick, the Alexander and the Bellflower (Bishop Pippin). These grow here to perfection, and the trade might be almost indefinitely extended. The Duchess grow much firmer than in the other provinces, and are shipped quite successfully to Great Britain in barrels. They are such excellent apples that they should be shipped in boxes, and would yield a splendid profit.

This year there was also a quantity of Alexanders exported to Boston. This is likely to be an increasing trade up to the limits of the capacity of the district to produce this variety. The freight and duty amounts to about 85 cents per barrel, and the price realized in Boston last year was \$5 per barrel. This leaves a very handsome profit, exceeding even that which could be reasonably expected on winter fruit from Nova Scotia or Ontario.

The crop in Quebec of Fameuse and McIntosh Red was rather short.

WINTER APPLES SHORT IN ONTARIO.

In Ontario the total crop was about an average one, but was not evenly distributed as to season, the heavier crop being the early and fall apples, leaving the winter apples considerably below an average crop. The aggregate of the crop, however, was fairly large, owing to the number of new orchards of winter apples coming into bearing.

PRICES AND PROFITS.

Perhaps the most unfortunate feature from the producer's standpoint, was the abundant crop of early fruit which, coming as it does in competition with other fruits and in connection with the warm weather, yielded very low prices and naturally affected the price of winter apples, which were sold by the producers in the early part of the season much lower than the aggregate of the crop would have warranted. With the exception of the apple dealers who dealt in Southern Ontario apples, few dealers have lost money even on early stock, and those that had invested in winter stock had the satisfaction of receiving the highest prices that have been paid for a number of years. The producers, however, got a fair price for their fruit. The

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dealers made more than ordinary profits and the consumers evidently wanted more fruit; so that the season can be considered a very favourable one.

• Apples were exported during this season to twenty-three different countries, though Great Britain is by far the largest consumer, Canada supplying about 60 per cent of all the apples imported there.

PEARS.

The pear crop was somewhat unevenly distributed. The largest number of commercial pear orchards are to be found in southern Ontario. Here the crop was large and fairly clean, and the season was favourable in almost every respect, though the fruit was perhaps slightly undersized. British Columbia harvested a medium crop; but in all other fruit sections the crop was particularly light. This did not affect market conditions materially. The prices were not high, but yet with the extra large crop the returns were exceedingly satisfactory. In other districts the crop was relied upon for home use only, and, therefore, the fact that there was not the usual surplus for sale, was not particularly noticeable.

PLUMS.

The plum crop was not a large one, and prices were good throughout the season, but not particularly high.

PEACHES.

The peach crop was excellent. The early varieties bore very heavily. This had the tendency of lowering prices, as the early varieties are not in demand except for dessert purposes. As the St. Johns came in, prices improved, but the crop was only medium of this variety, and very light of the Early Crawford type. The Elberta, Smock and similar varieties were a good crop, and prices were fairly high. The canning factories offered 3 cents per pound for Smocks. Owing to the excellent weather conditions for the late peaches, the harvesting and shipping were done with very little loss.

GRAPES.

Grapes as usual were an excellent crop. They were the only fruit of which there appeared to be a slight surplus and where prices were somewhat below normal. This can be accounted for in part by the action of the wineries, which were not in a position to buy the usual quantities. As about one-third of the crop of grapes is used for wine, this naturally threw an abnormal quantity of grapes on the markets, with the natural result of lowering the prices. This was not an altogether unmixed evil. The grapes were an excellent crop, and the season was particularly favourable for ripening them to perfection and, no doubt, these grapes, of better quality than usual, at comparatively low prices, found their way into many markets that will be open for large quantities another year.

SMALL FRUITS.

Small fruits were all somewhat more than a medium crop and prices were good, both at the canning factories and on the general market. Cranberries and blueberries formed a larger feature of the fruit trade than usual this year. The partial shortage of cranberries in the United States made it possible to export Canadian berries, and the season favoured picking a full crop, so that there was much encouragement given to the cranberry growers of the Dominion, a profitable line of fruit growing that might be followed to a much greater extent than it is. The blueberries of Nova Scotia, New Brunswick and Quebec are commanding attention and are now not only offered freely on the markets of our large cities, but are being canned in large quantities.

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Many large sections of the maritime provinces and Quebec that formerly yielded nothing, are now furnishing a large revenue to those who appreciate the value of blueberries.

INSECT AND FUNGOUS PESTS OF THE YEAR.

The Codling Moth and the Apple Scab still continue to be the greatest insect pests. These were not more prevalent than usual this year, and nothing new has been developed in the mode of combating them. The standard remedy for both is the poisoned Bordeaux mixture. If this is carefully applied four times during the season, 90 per cent of the fruit will be free from infestation. Careful records have been made of the cost of spraying for the purpose of determining the profits. The cost, of course, depends upon the size of the trees, but with ordinary full-grown trees of the Baldwin type, spraying should not cost more than five cents per tree for each application, or twenty cents per tree during the season. This would make an average cost of ten cents per barrel of fruit one season with another. On an average crop of one acre, the cost of spraying would probably be about \$12 or \$15, certainly not more. The gain by the improvement of the grade of fruit and in the quantity of saleable fruit would be certainly not less than \$25 or \$30, and in all probability it would be much more than this.

It can thus be readily seen that even on a very small orchard, the cost of an outfit, say \$25, would be returned many times the first year and the outfit would still be serviceable for many years more. Spraying is one of the most profitable operations on the farm, and is neither difficult nor particularly expensive. If the spraying were done just for the Codling Moth and Apple Scab alone, nine-tenths of all other insect and fungous pests would be killed at the same time. It does not, therefore, require a very intimate knowledge of insect and fungous diseases to be able to combat them quite successfully.

While it is desirable that every operation on the farm should be followed intelligently, nevertheless mechanical rules for spraying can be given that will enable an orchardist to spray successfully even though he knows little or nothing of the life history and habits of the enemies he is combating. For these two pests (Codling Moth and Apple Scab) the best rule is to spray as soon as the buds open in the spring, with the poisoned Bordeaux mixture. Spray again, if possible, just before the blossoms open. If any spraying is to be missed, this is the one. Make at least one spraying after the leaves are out before the blossom is open. Spraying should be done immediately after the blossoms have fallen. This should be done very promptly, before the Calyx lobes close, so as to cover the calyx tube. This takes place usually in five or six days after the petals have fallen. The next spraying should be given ten days or two weeks later. Very great advantage is obtained from spraying quite late in the season, especially with the tender varieties of apples, such as the Snow and McIntosh Red, if the weather happens to be somewhat wet in July or August.

OTHER INSECT PESTS.

The work of the Curculio is everywhere apparent to a greater or less extent. This insect is identical or closely allied with the plum Curculio, and, like the plum Curculio, can be combated by spraying with the poisoned Bordeaux mixture early in the season, as it feeds in part upon the leaves of the tree. The injury done by the Curculio consists in cutting the surface either for the purpose of feeding or egg-laying. These wounds frequently cause the apple to be misshapen, or they furnish the means whereby fungous spores enter the tissue of the apple, and thus reduce many fruits to the condition of culls that might otherwise be first-class. No special attention need be given this insect if the spraying recommended for the Codling Moth and Apple Scab is attended to, though it is worth while to note that in the case of the

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Curculio, as with many other insects, there is less difficulty when the ground is thoroughly cultivated than when it is left in sod.

THE CANKER WORM.

The Canker Worm has been very prevalent in Nova Scotian orchards for two or three years, and is sporadic in Ontario. This insect is destroyed by the first spraying, recommended for the Codling Moth and scab, but the poisoned Bordeaux mixture must be applied very early in the season. If it is left until the insect grows to any extent, the mixture must be stronger in poisoned material than is safe to apply to the leaves of the tree. Winding the trunks of the trees with a bandage of sticky material, that catches the wingless female as she attempts to pass up the tree for egg laying, is of great assistance.

CIGAR CASE BEARER AND BUD MOTH.

The Cigar Case Bearer and Bud Moth are two comparatively new insects to many fruit growers. They are particularly troublesome in young orchards. In fact, many fruit growers made their first acquaintance with these insects through the specimens discovered on their new plantations. The insects are readily distributed through nursery stock. The work of both insects is somewhat insidious, and quite frequently the careless fruit grower does not know why the trees look so unhealthy. The Bud Moth commences its work very early in the season, and usually destroys many terminal buds. Its presence is indicated by the centre being eaten out of the buds and by the young shoots and terminal leaves being rolled and fastened together, including the shrivelled and brown leaves that are dying.

BLISTER MITE.

The leaf Blister Mite was quite prevalent on the apple foliage in Ontario this season, especially in the fruit belt along the north shore of Lake Ontario.

The Mite hibernates under the bud scales during the winter, which it leaves in the spring to burrow into the skin of the new leaves in order to feed upon its juices and soft tissues. Raised blister-like structures called galls are produced on the lower surface of the leaves through the irritation set up by the work of the insect within the leaf. Entomologists, in studying the life history of the Mite, find that the young Mites, which hatch from eggs laid within the gall covering, pass out to work on other leaves. Thus it is seen that this pest can spread very rapidly. Under favourable conditions the Mite has been proven to infest the foliage of an orchard so that hardly a leaf can be found which is entirely free from its work. The writer saw an orchard in north eastern New York State last fall, which was so badly infested that the foliage presented a severely scorched appearance. There was not a leaf in the whole orchard which was not covered with the dark brown and black pimple-like galls. The trees in this orchard were very much neglected and furnished an excellent example of the rapidity with which the Mite will spread under such conditions.

Sulphur sprays have been found to give the best results in the control of the Mite. Applications of the lime-sulphur wash may be made in the fall after the majority of leaves have fallen, or in the spring until the buds commence to break and to show the tips of the young leaves. Treatment should not be made later than this as the sulphur sprays are very destructive to the tender foliage, and the mites may have gained entrance into the leaves where they would be beyond the reach of the mixtures.

FUNGOUS DISEASES.

Fungus diseases were on the whole somewhat less troublesome than usual.

The Peach Leaf Curl did considerable damage to the foliage in the commercial peach sections of Ontario. The Elberta and Triumph varieties seemed to be affected most.

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Spraying in February and March with bluestone or the lime-sulphur mixture will keep this disease in check.

Orange Rust was noticed on blackberries in some localities in Ontario. The canes showing this disease should be cut out and burned.

Powdery Mildew was destructive to gooseberries particularly in Nova Scotia and British Columbia.

The development of Apple Scab was not quite so marked in Ontario on apples generally as it was the previous season. The Greening and Fameuse varieties, however, were very spotted where they came from orchards which were not carefully sprayed.

BROWN TAIL MOTIL.

The Brown Tail Moth has not been entirely stamped out of Nova Scotia. There is also a possibility of it being imported on nursery stock from the United States or Europe. The general appearance and habits of this insect, together with the methods of controlling it, should be noted by every grower, so that in case it should appear in uninfested localities it may be recognized and checked before it obtains a foothold or does serious damage.

The Moth is pure white except at the tip end of its body, which is brown in both sexes. The female has a tuft of brown hair at the tip of the abdomen. There is only one brood in the year.

In July the eggs are laid in masses of about three hundred on the lower surface of the leaves. These egg masses are brown in colour, due to a thick covering of golden brown hairs from the tip of the body of the moth. When the young caterpillars have hatched, they feed for some time on the upper surface of the leaves. As winter approaches the small caterpillars crawl to the tips of the branches and fasten a few leaves securely together with silk. They then remain dormant within these 'tents' throughout the winter. The winter webs are from one to four inches in length and from one to one and a half inches thick.

About the time the buds are bursting in the spring the caterpillars emerge and commence their destructive work. The caterpillar is dark, covered with rusty hairs, and there are two reddish-yellow cushionlike tubercles on segments of the abdomen which the insect raises and lowers at pleasure.

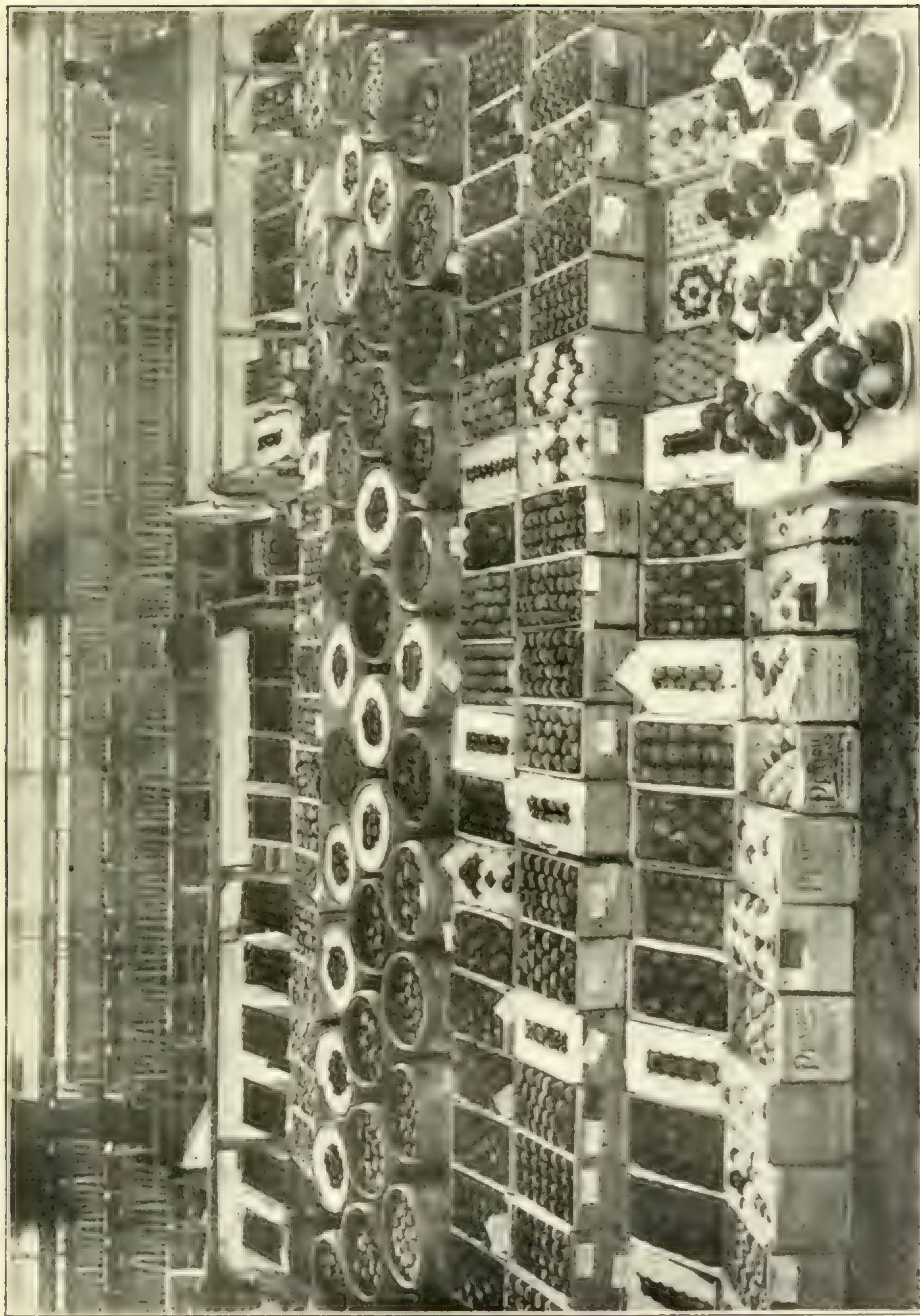
The collection of the winter nests is the best means of controlling the insect. These must be carefully handled in order to avoid the rash which is produced when the 'stinging' hairs attached come in contact with the skin. Collecting must be done before the buds burst, after which the trees should be sprayed with some poisonous arsenical mixture for the destruction of the caterpillars which may have been missed.

Mr. G. H. Vroom, Dominion fruit inspector in Nova Scotia, has been employed several weeks each year since the discovery of the Moth in Nova Scotia in the effort to destroy this pest.

EVAPORATED APPLES.

THE EVAPORATOR AND HIGH GRADING.

In the enforcement of the Fruit Marks Act our chief dependence is placed upon the detection of fraudulent marking and packing, by the Dominion fruit inspectors. Nevertheless, it has been noted that certain methods of doing business and certain practices, assist very greatly in improving the grading and marking of fruit and bringing the standard up to that required by the Fruit Marks Act. The establishment of co-operative associations has made a complete revolution within the sphere of each society's influence. Only less beneficial is the establishment of co-operative evaporators.



The Ontario Fruit, Flower and Honey Show, 1908.

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THE BEST EVAPORATING STOCK NOT NECESSARILY THE BEST SHIPPING STOCK.

Evaporated fruit furnishes an outlet for apples that the owners feel are too good to be wasted, and yet do not make good shipping stock. Such fruit should not be classed as waste fruit. It is not such. It may be the very best fruit for evaporating purposes, but not suitable for shipping; as, for instance, in the case of a fully matured apple which is just in the proper condition for evaporating, and may have no defects whatever for a shipping fruit except that it is overmatured, and, therefore, will not reach the consumer in good condition. Of course, there are grades of fruit not so good for evaporating, but which make excellent stock, such as fruit slightly affected with scab and those having the skin slightly broken. The temptation is very strong when there is no other outlet for these apples, to place them with shipping stock and to send them forward. The usual result is that decay sets in, which, in addition to contaminating the fruit, may cause the barrel to go slack, injuring the contents severely by barrel bruising. Quite frequently five per cent of this slightly defective fruit, that looks sound and quite suitable for shipping, except to the experienced packer, is the cause of serious depreciation in a barrel otherwise excellent. Where this slightly defective fruit can be disposed of regularly and for its full value to evaporators, there is little or no temptation to include it in shipping stock. The price that can be realized through co-operative evaporators is only slightly less than the price realized as green fruit. Hence, in all such cases, only the best grades are shipped and the lower grades are consigned to the evaporator to make a grade of evaporated stock that meets every requirement of a high class market.

VALUE AND PRICES.

Independent evaporators paid last year from 25 to 35 cents per hundred pounds for green apples. The co-operative evaporators realized nearly 50 cents. The market for evaporated apples was fairly good, first class stock bringing from 6 to 6½ cents f.o.b. at the factory.

The following table gives a comparison between the exports of evaporated apples and green apples from Canada and the United States respectively:—

| Year. | Country. | Evaporated Apples. | Green Apples |
|---------------|---------------|--------------------|--------------|
| | | Lbs. | Bbls. |
| 1908. | Canada | 6,959,988 | 1,629,130. |
| 1908. | United States | 35,054,763 | 1,052,999 |

It will be noted that in proportion to the quantity of apples exported green, Canada exports comparatively little evaporated fruit, the indication being that this branch of the industry is not fully developed. No doubt a very large revenue that might be made from Canadian orchards is sacrificed in apples that are left in the orchard after the best grades have been taken out.

SOUTH AFRICAN TRADE.

As the result of the establishment of a steamship line between Canada and South Africa, a small trade in apples has sprung up between the two countries. For two or three years these shipments have been made but not with complete success.

THE SOUTH AFRICA FRUIT PEST LAW.

The requirements with reference to the admission of fruit in South Africa are very stringent. The apple scab and codling moth are regarded as particularly objec-

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tionable. Every year, at least, a part of the cargo going from Canada has been refused admittance on account of fungus or insect pests. This has resulted in severe losses to the shippers and a great discouragement to the trade.

VARIETIES SENT, 1908.

During the season of 1908, about two thousand barrels of apples were sent to South Africa. One-third of these went from Nova Scotia, the remainder from Ontario. There was little complaint with reference to the Ontario apples. The four chief varieties were Northern Spy, Golden Russet, Baldwin and Ben Davis. There were a few Ganos, Canada Red, Stark and Cooper's Market. These varieties are quite acceptable and when grown clean find a ready sale in South Africa. The varieties going from Nova Scotia, were Golden Russet, Nompereil and Ben Davis. Unfortunately, these were so infested with scab (*Fusicladium*) that they were refused admittance.

In order to meet the requirements of the South African trade, the apples must be practically free from scab or insect pests. Such fruit can be obtained in Canada, but not from the ordinary stock of apple dealers. An effort will be made this year to place this South African order, which will mean about three thousand barrels, where there will be no doubt about the cleanness of the fruit.

NOVA SCOTIAN PACKING AND MARKING DEFECTIVE.

Another defect in the Nova Scotian apples was that some of the barrels were falsely marked and fraudulently overfaced. It is unfortunate that these fraudulently marked and overfaced apples were from Nova Scotia. This province is well situated to command the South African trade. With common honesty in the packing and good judgment in the selection of the stock, the South African market ought to be supplied exclusively from Canada and particularly from Nova Scotia. It is to be hoped that the trade next year will show better results.

FRUIT FOR THE FRANCO-BRITISH EXHIBITION, LONDON, ENGLAND, 1908.

Beginning August, 1907, a collection of Canadian fruit was made for the Franco-British Exhibition held in London this season.

Fruit was secured during the fall from Ontario, Quebec, Nova Scotia and British Columbia and shipped to Montreal, where it was placed in cold storage until it should be required in London.

The fruit was collected under many disadvantages. The season of 1907 was very dry and fruit was under-sized, so that it was exceedingly difficult to secure, at the close of the season, a large quantity that would fairly represent the Dominion. A large quantity of very choice winter fruit that had been selected in Durham and Northumberland counties was left on the trees to secure perfection in colour till October 20. Unfortunately a heavy frost came the nights of the 20th and 21st, and injured the fruit to such an extent that it could not be regarded as good keeping stock. The frost was quite unprecedented. Apples were on the trees two weeks later this year without injury. Under the circumstances, we were obliged to supplement the prime stock we had already secured by selection from fruit stored for commercial purposes at Montreal. This was afterwards treated the same as the fruit previously collected. Pears and other fruits were also selected and sent to the Exhibition Branch of the Department of Agriculture, to be bottled for the London exhibit.

On April 4, 1908, the first shipment of exhibition apples was made from Portland to London. There were 873 boxes and 3 barrels in the shipment. These apples were taken from a temperature of 32 degrees, in which they had been held all winter, and shipped by express to Portland, the temperature being held at 34 degrees in

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transit. The apples were carried at an average temperature of 34 degrees Fahr. from Portland to London, and landed in first class condition at the Surrey Commercial Docks, London, where they were placed in storage at a temperature of 32 to 33 degrees.

This first consignment consisted of:—

22 boxes and 1 barrel, grown in British Columbia.

427 boxes and 1 barrel, grown in Ontario.

269 boxes and 2 barrels, grown in Quebec.

155 boxes and 2 barrels, grown in Nova Scotia.

The following is an extract from the report of the official in charge of the fruit exhibit, who examined the fruit upon its arrival:—

‘I examined the fruit on its arrival, opening one case of each variety. The apples were well packed and of more uniform size than those we received formerly.’

The exhibition fruit sent from the cold storage in Montreal was carefully packed in boxes, just as for commercial purposes, except that a layer of excelsior was placed at the top and bottom of the boxes. The excelsior occupied the space of about one-half a tier of apples and is necessary for carrying exhibition specimens. No excelsior was placed on the sides of the boxes and, in consequence, an occasional specimen was bruised slightly. The damage would have been more serious but for the fact that the fruit was carefully wrapped in a double thickness of paper. For commercial purposes the excelsior is not needed except for extra fancy specimens.

A few barrels were used experimentally, some packed in the ordinary way, except that the fruit was wrapped in paper. The fruit came out in good condition, but showed some barrel bruises as the result of pressure, that spoiled them for exhibition purposes.

The fruit in two barrels packed in cork waste, was free from bruises, but the cork shavings, being dry, had apparently absorbed the moisture from the apples, so that they came out somewhat withered and decidedly unattractive in appearance.

Incidentally, this shipment demonstrated most conclusively that Canadian apples can be stored in Canada till navigation opens in May, and then be placed in good condition on the English market. The quality, as tested in London, was excellent, and the condition such that the apples stood exposed on tables for several weeks until they shrivelled. There is no reason why the market for Canadian apples should not be extended two months at least after the usual time, by the use of cold storage. The extra cost would not be more than twenty to thirty cents per barrel. The market would not take the large quantities absorbed during the fall and winter months, but the price would be much higher. The competition would be with the Australian, Tasmanian and New Zealand apples.

EXHIBITION FRUIT, THE GROWTH OF 1908.

Shipments of exhibition fruit were sent to London from Montreal during the summer and fall of 1908. These consisted of apples, pears, peaches and grapes. All arrived in excellent condition, and did much to advertise the fruit-growing capacity of Canada, and dissipate erroneous conceptions of the Canadian climate.

BRITISH COLUMBIA SHIPMENT OF EXHIBITION FRUIT TO LONDON.

An especially interesting feature in connection with the Canadian Fruit Exhibit was the car of exhibition fruit from British Columbia. This car was shipped from Lytton, B.C., on the evening of October 3rd, and arrived at the wharfs in Montreal on the afternoon of October 9th. The car was well iced throughout the journey. The bunkers of the car upon its arrival in Montreal were found to be well filled with ice, and the fruit registered 58 degrees Fahrenheit after it was unloaded. There were

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450 boxes of fruit in the shipment, which contained seven varieties, viz.: Blue Pearmain, Spitzenburg, Jonathan, King, Gano, Cooper's Market and Lawver.

The inspectors at Montreal found the fruit good exhibition stock in perfect condition.

The fruit was loaded in the cold storage compartment on board ship immediately after it was inspected. The vessel sailed the next morning, October 10, for London.

The temperature of the compartment in which the fruit was stored, was kept at an average of 33 degrees throughout the voyage.

The fruit, at the time of landing in London, was found in perfect condition.

THE EARLY APPLE AND TENDER FRUIT TRADE.

A large part of southern Ontario has all the requirements of soil and climate to insure success in early apples and tender fruits. The early apple trade has not developed because the transportation facilities would not permit of any market being reached except the extremely limited local market. The opening up of the Northwest, the establishment of a refrigerator car service to almost all points, and the equipment of ocean steamers with refrigerator chambers have changed the whole situation within the last few years. So rapid have been the changes that the fruit growers of this favoured district do not appreciate the changed conditions and so fail to take advantage of the opportunity to better their circumstances.

EARLY EFFORTS OF THE DAIRY COMMISSIONER'S BRANCH.

In the early part of July, 1906, the Dairy and Cold Storage Commissioner, acting upon a resolution brought up at the Dominion Conference of Fruit Growers, held in Ottawa in March, 1906, wrote to several steamship companies in Montreal, soliciting suggestions as to the best means of meeting the difficulty experienced by growers in securing sufficient quantities of early fruits to fill even the smallest cold storage chambers on their boats.

The steamship companies signified their willingness to assist the prospective shippers of this early fruit in various ways. One line suggested co-operation among shippers to increase the quantity of fruit and insure the filling of one cold storage chamber at least. Another line was of the opinion that they could arrange to take one or two cars in cold storage if they were given two weeks notice of intended shipments. Still another line expressed their readiness to book for shipment, in cold storage on three of their London bound vessels, quantities of fruit, not under twenty-five packages from each shipper, provided they were given a week's notice of such intended shipments. They suggested, also, that the growers contemplating making such experimental shipments should communicate directly with them.

The information contained in this correspondence with the steamship companies was circulated among the large fruit shippers. Arrangements were also made with the Canadian Pacific and Grand Trunk Railways to supply iced cars for export shipments to Montreal, between August 1 and September 30, 1906. The department agreed to pay icing charges to the extent of \$5 per car. The cars were to be supplied by the railways on demand of the shipper to the local agent.

These arrangements, though very liberal, implied that fruit growers should co-operate, and it was found impossible to bring this about. It was also found impossible for shippers to give notice any considerable time ahead of the date when they intended to ship their fruit, owing to the fact that the fruit ripens somewhat irregularly. The quantity of fruit and exact date of shipment could not be given more than a few days in advance.

The few shippers who took advantage of the cold storage facilities provided by the railways and steamship companies for early fruit shipments, were much pleased with the way their fruit was landed in the old country markets. One shipper, in par-

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ticular, was able to land early pears shipped from western Ontario, in the latter part of August, in the markets of Glasgow, Manchester and Liverpool in good condition, and obtained a good price for them. It is to be noted, however, that this particular shipment of pears was very carefully packed in twenty pound cases and shipped by express to Montreal, so that the packages would be placed in the cold storage compartment of the vessel with the least possible delay.

SHIPMENTS OF EARLY APPLES

During the summer of 1908, the Dairy and Cold Storage Commissioner made special arrangements (as outlined in Part V., 'Cold Storage Division' of this report) for the reservation of cold storage chambers for fruit only on four steamers leaving Montreal.

INSPECTION AT MONTREAL.

The inspectors at Montreal found the quality and condition of the early fruit shipped in these cold storage chambers variable, but on the whole very good.

It was noticeable that the early apples packed in barrels, arrived in Montreal not in the best condition. A lack of uniformity in grading and a high temperature causing overripe fruit, were in evidence in most of the barrel pack. The apples in some barrels showed decay on the first row around the press marks.

On the other hand, the boxed apples and pears arrived in Montreal in first class condition generally. The peaches and grapes arrived at shipside in excellent shape, and there was every reason to believe they would carry all right in cold storage throughout their long ocean voyage.

The Montreal inspectors' remarks upon the peaches shipped by the St. Catharines Cold Storage and Forwarding Company, St. Catharines, which were being sent to London, were as follows:

Shipment for boat sailing from Montreal, August 22.

'The peaches were in excellent condition; and, though they were not striking as to size and the colour rather dull, it is our opinion that they will carry safely.'

Shipment for boat sailing from Montreal, September 5.

'The peaches were firm, of good colour, smooth and should carry all right. They were double wrapped, with a layer of cotton batting on the top and bottom. The temperature of the fruit was 52 degrees and the shed 72 degrees Fahr.'

Shipment for boat sailing from Montreal, September 19.

'The peaches were well packed with excelsior and batting cover. The fruit was large, well coloured and sound. For the most part the peaches were hard, but a few had become a little mellow.'

There were also shipped on this boat several boxes of peaches from the Grimsby Co-operative Company, packed in special boxes. 'The peaches were in good condition, large and sound with the exception of a few which had commenced to get a little mellow. The fruit was wrapped in different coloured tissue paper and presented a very attractive appearance.'

The St. Catharines Cold Storage and Forwarding Company sent several boxes of grapes on this boat. 'The grapes were in excellent condition, sound and with the bloom still on them. The bunches were wrapped separately in tissue paper and the whole layer of fruit wound in cotton batting. There was one layer to each box.'

Condition of fruit arriving in London, ss. 'Ontarian':—

Sailed August 22 from Montreal.

Arrived September 3 at London.

Packages carried at temperature of 34 to 36 degrees Fahr. Fruit arrived in good condition in every case where it was loaded on the steamer at Montreal in good condition.

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SS. *Sicilian*:—

Sailed August 29 from Montreal.

Arrived September 11 at London.

Packages arrived at temperature of 34 to 36 degrees Fahr. Fruit arrived in good condition. The peaches were in good shape when delivered.

SS. *Hurona*:—

Sailed September 5 from Montreal.

Arrived September 17 at London.

Packages arrived at temperatures from 32 to 36 degrees Fahr. Apples, pears and peaches arrived in good condition.

SS. *Hungarian*:—

Sailed September 19 from Montreal.

Arrived October 3 at London.

Temperature of storage, 36 degrees Fahr. Fruit arrived in good condition. The peaches and grapes were highly satisfactory, the fruit retaining its bloom.

In these shipments were included boxes of exhibition fruit for the Franco-British Exhibition in London. In order to test the quality and demand for Canadian early apples, samples were sent to four of the leading fruit merchants in that city, two of whom were in the retail and two in the wholesale trade, asking them for the following information:—

- (1) Are these varieties of apples desirable for the English market?
- (2) Could we obtain a *better price* for these apples owing to the fact that they can be put on the market *earlier* than our fall varieties?
- (3) Could you suggest any method of packing or any kind of package which in your estimation would secure the best prices and the briskest demand for these apples?

The replies of the fruit dealers to these queries have a very interesting bearing upon the possibilities of the development of a profitable early apple trade with the mother country. Two of these letters appear below. The first communication is from a retail firm and the second from a wholesale firm.

GENTLEMEN,—We are in receipt of yours of the 16th instant, and have also received the samples of apples, and have carefully examined them, finding the samples very good of each. The varieties are also good ones for early sale here, and some years they would do exceptionally well. This year, however, there is a very large crop of English apples, the bulk of which are put on the market through August and September, so that prices are not up to the average.

The fact that crops of apples here are so uncertain year by year has kept our growers from any proper system of arranging to keep their crops, so that you will see when the exceptional crop comes, the market is very much flooded, as they are taken from the trees.

As a rule, however, these early varieties would pay you to send, and even this year the colour of the 'Red Astrachan' and 'Duchess'—and the fact of them both being suitable for dessert apples—would enable us to get better prices than the bulk of the English coming on the market. We think the best way to pack these two or similar dessert apples, is in the 40-lb. box net, which is now almost universally used for the Californian, Oregon and other States for their dessert apples, as well as all coming from the Australian colonies being packed in the same way; and as the earlier varieties are naturally rather softer, it is best to wrap each fruit in paper in the same way that the above are always packed, as it not only protects the fruit, but they colour rather more quickly, and generally result in a better, clearer colour than if packed without any wrapping.

The 'Alexanders,' too, would come well in this way, unless they were extra large, which often happens with this variety off young, vigorous trees, but as they

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are only used for cooking, the 'case' would not be so useful as for the dessert varieties, all our best buyers now being able to buy dessert apples in cases the whole year through, and are more each year in favour of all dessert apples being packed in this way.

One reason is that so many stores and retail firms can get consumers to take a case where they could not induce them to take a barrel. Another great advantage is that customers can examine the smaller package more easily, and if they are graded into ones and twos for the larger and medium good fruit, keeping all small and bad-shaped fruit out, we should be able to do very well with a regular supply of good dessert varieties packed in this way. We are making a special line of best dessert apples for our customers all the year round, and are continually getting good grocers to sell them, who at one time did not touch fresh fruit at all, and we do not sell by auction, so you will realize that if we can keep customers regularly supplied with good dessert fruit in the same size case all the year round, it must be of great advantage to the senders as well as being more easily worked by us as distributors.

Yours faithfully,

(Sgd) GEO. MONRO.

P.S.—Cooking varieties seem to do best in the barrels if well graded.

LONDON, S.W., September 17, 1908.

DEAR SIRS,—We are in receipt of yours of the 16th instant, and thank you for the case of apples. We may mention that we know these varieties very well and rarely, if ever, do they arrive here in good condition, even when sent in cold storage. The Red Astrachan and Duchess are particularly soft, and you will have seen that, even with the care taken of these, the fruit has arrived bruised. The Alexanders travel fairly well, when packed in this way, but the realization on the English market would not be sufficiently high to admit of a profitable business being done.

Up to the present time a successful business has been done in Canadian apples only when the fruit has been packed in barrels. When it has been packed in cases of 40 pounds there has been a limited demand, and as far as our experience goes, the results have not been as satisfactory as for barrels.

At all times at your service, we are,

Yours faithfully,

(Sgd) GARCIA JACOBS & CO.

The letter from Garcia Jacobs & Company, is given to show their experience with barrels. It can be assumed at once that this early apple trade must be done in boxes to be uniformly successful. It is equally true that common stock will not sell in boxes even for the prices it will bring in barrels. This firm had no adverse criticism to make on this sample of fruit.

Later sample cases of Elberta peaches and some assorted pears were sent to Messrs. Wm. Brooks & Son, and to Messrs. Geo. Monro, Limited, with the following letter:—

Dear Sir,—We have pleasure in sending you sample cases of Elberta peaches, shipped from Montreal on September 19, which arrived here October 4. They were in excellent condition on arrival, and are keeping well in our exhibit beyond our expectations. We are also sending you a few sample pears, Duchess, Sheldon, Anjou, Howell, Clairgeau and Bosc. This fruit was not kept in cold storage previous to packing.

The shipping of this fruit is a matter of experiment and we are anxious to know if these peaches would sell readily on the London market at this season, assuming that they reached it in good condition, and would keep well during a week after arrival. The peaches are in the original package and have not been disturbed, in order to give you a true idea of their condition.

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The following reply was received from Messrs. Monro, Limited:—

‘Dear Sir,—We duly received the sample cases of Elberta peaches and the box with samples of pears.

‘The peaches arrived in extra good condition compared with others of the same variety that are coming on the market, and we were able to realize more money on them than on the average from other sources. The fact of this sort being rather uncertain as to condition, depreciates the sale, as so many of them are in rather ripe condition and go rotten very quickly on the salesmen’s hands, so that you must not lead your people to think that they would make this money in quantity. At the same time, we should advise you to draw their attention to the fact that they should not be allowed to get too ripe before sending.

All the pears are fairly saleable sorts, but the ‘Clairgeau’ is very treacherous, and if they arrive at all ripe are worthless. We should, therefore, suggest that you advise the growers to follow more on the Californian varieties such as the Doyenne du Comice,’ ‘Brown Beurre,’ ‘Winter Nelis’ and ‘Glout Morceaux,’ which are all a better quality than those you send, and being well known here, find a ready sale. As far as the market for peaches is concerned, we are almost clear now and really good ones in good condition would find a ready sale. The English and French now are practically finished.’

Yours faithfully,

(Sgd.) GEO. MONRO.

Messrs. Brooks & Son, wrote as follows:—

DEAR SIRS,—We have duly received your sample case of peaches, which was in fairly good condition. We should think that if you could get same to this country in good condition they would make a fair price. If you have any more of your exhibit you can forward them on to us and we will do our best for you. We have sold your case and are allowing you 10s. for same.

Thanking you for your letter, we are,

Yours faithfully,

(Sgd.) W. BROOKS & SON.

Re Case of Pears.

We should think they would make a fair price only that they would clash with the Californian and the State pears, and the kind you send as a sample are only the cheaper varieties.

| | |
|---------------------|--|
| Comice (Doyenne du) | } These are the best kinds and should advise you to send these if possible. |
| Easter Beurre | |
| Beurre Hardy | |

Yours faithfully

(Sgd.) W. BROOKS & SON.

COMMENTS BY THE REPRESENTATIVE OF THE EXHIBITION BRANCH.

‘It is evident that the peaches are in demand, as Mr. Monro credits us with 15s. or \$3.65 for the box of thirty-three peaches we sent him. Mr. Brooks credits us with 10s. or \$2.43 for a box of thirty peaches. Averaging the two boxes, the wholesale price received would be nearly 10 cents each for the peaches. Peaches about the same size as ours are selling retail at 1s. or 24 cents each to-day (October 26, 1908) in the retail fruit stores, while pears are selling at from 2d. to 6d each according to size and quality.

‘Apples are retailing at from 2d. to 4d. per pound according to quality.

‘The quality of apples shown in our exhibit has been, I may say, as great a feature as their appearance. We have had constantly over 2,200 apples of different varieties in our apple show. These apples were distributed over 145 plates, 150 glass stands and 100 large glass jars, and placed on 29 tables and on many feet of shelving.

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‘Taking everything into consideration, I believe that our fruit exhibit at the Franco-British exhibition is the best we ever had, and that it has created much interest and admiration is an acknowledged fact.’

THE PEACH TRADE.

The success attending the shipment of the Elberta peaches is particularly gratifying. This variety is being planted very extensively. There are thousands of acres of land in southern Ontario, used in general farming, that will grow Elberta peaches to perfection. If the confidence of growers can be established that the markets will develop for this peach, there is the possibility of a very large and most profitable trade.

IMPORTED FRUIT.

REGULATIONS FOR MARKING.

The regulations with reference to the marking and grading of foreign apples are practically the same as for home grown fruit. The importers of the fruit are obliged to mark it in accordance with the Fruit Marks Act (Inspection and Sale Act, Part IX.) as if they were the original packers. That is, they are obliged to place their name and address upon it, and if the grade marks are not already upon it to mark the fruit with the marks prescribed. The importers are then held responsible just as the packer is in the case of home grown fruit.

IMPORTATION OF AMERICAN APPLES.

The following table shows the importation of apples into Canada from the United States by periods, ending December 31, 1908:—

STATEMENT showing the importations of Apples into Canada, by Ports, for the under-mentioned periods for the year 1908.

| Ports. | APRIL 1 TO AUG. 31, 1907. | | SEPTEMBER, 1908. | | OCT. 1 TO DEC. 31, 1908. | |
|------------------|------------------------------|--------|---------------------|--------|-----------------------------|--------|
| | Barrels. | Value. | Barrels. | Value. | Barrels. | Value. |
| | | \$ | | \$ | | \$ |
| Ontario— | | | | | | |
| Chatham | 1 | 6 | | | | |
| Fort William | 25 | 109 | | | | |
| London | | | | | 1 | 2 |
| Morrisburg | | | | | 10 | 25 |
| Ottawa | 5 | 20 | | | 6 | 17 |
| Port Arthur | 142 | 686 | | | 3 | 16 |
| Sault Ste. Marie | 2 | 10 | | | | |
| Toronto | 105 | 271 | | | 20 | 43 |
| Windsor | 40 | 119 | | | 3 | 6 |
| | 378 | 1,221 | | | 43 | 109 |
| Quebec— | | | | | | |
| Montreal | 143 | 65 | | | 520 | 1,112 |
| Quebec | 297 | 547 | | | 6 | 9 |
| Rimouski | | | | | 1 | 2 |
| St. John's | | | | | 7 | 17 |
| Sherbrooke | 181 | 247 | | | 221 | 370 |
| Three Rivers | | | | | 2 | 2 |
| | 721 | 1,427 | | | 777 | 1,512 |

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STATEMENT showing the importations of Apples into Canada, by Ports, for the under mentioned periods for the year 1908—*Concluded.*

| Ports. | APRIL 1 TO AUG. 31, 1908. | | SEPTEMBER, 1908. | | OCT. 1 TO DEC. 31, 1908. | |
|---------------------------|------------------------------|--------|---------------------|--------|-----------------------------|--------|
| | Barrels. | Value. | Barrels. | Value. | Barrels. | Value. |
| | | \$ | | \$ | | \$ |
| Nova Scotia— | | | | | | |
| Digby..... | | | 1 | 4 | | |
| Halifax..... | 795 | 2,928 | 146 | 541 | 3 | 22 |
| North Sydney..... | 22 | 81 | | | | |
| Pictou..... | | | 2 | 6 | | |
| Sydney..... | 244 | 818 | 274 | 854 | | |
| Truro..... | 4 | 15 | | | | |
| Yarmouth..... | 78 | 256 | | | | |
| | 1,143 | 4,038 | 423 | 1,405 | 3 | 22 |
| New Brunswick— | | | | | | |
| Bathurst..... | | | | | 3 | 6 |
| Fredericton..... | 13 | 39 | 2 | 9 | | |
| St. John..... | 691 | 2,670 | 9 | 27 | | |
| St. Stephen..... | 4 | 18 | 1 | 3 | 18 | 42 |
| Woodstock..... | 14 | 40 | | | | |
| | 722 | 2,767 | 12 | 39 | 21 | 48 |
| Manitoba— | | | | | | |
| Brandon..... | 1,269 | 5,148 | 1,128 | 4,627 | 328 | 918 |
| Emerson..... | 6 | 26 | 11 | 45 | 11 | 45 |
| Gretna..... | | | | | 3 | 10 |
| Winnipeg..... | 3,052 | 11,365 | 952 | 3,422 | 1,485 | 5,098 |
| | 4,327 | 16,539 | 2,091 | 8,094 | 1,827 | 6,071 |
| British Columbia— | | | | | | |
| Grand Forks..... | | | | | 31 | 1,392 |
| Greenwood..... | 43 | 129 | 28 | 84 | 164 | 358 |
| Kaslo..... | 7 | 48 | 33 | 133 | 23 | 98 |
| Nelson..... | 557 | 2,894 | 756 | 2,242 | 4,218 | 14,731 |
| New Westminster..... | 19 | 42 | | | 43 | 118 |
| Prince Rupert..... | | | | | 26 | 152 |
| Rossland..... | 194 | 854 | 399 | 1,296 | 1,129 | 4,015 |
| Vancouver..... | 2,707 | 18,104 | 1,193 | 4,873 | 2,669 | 10,187 |
| Victoria..... | 1,436 | 7,413 | 203 | 813 | 778 | 2,552 |
| | 4,963 | 29,484 | 2,612 | 9,441 | 9,401 | 33,603 |
| Prince Edward Island— | | | | | | |
| Charlottetown..... | 39 | 131 | 39 | 133 | 3 | 10 |
| Summerside..... | | | | | 1 | 3 |
| | 39 | 131 | 39 | 138 | 4 | 13 |
| Alberta and Saskatchewan— | | | | | | |
| Calgary..... | 954 | 3,256 | 1,173 | 3,705 | 7,583 | 23,235 |
| Edmonton..... | 271 | 1,146 | 94 | 293 | 1,482 | 4,782 |
| Lethbridge..... | 247 | 1,173 | 465 | 1,520 | 2,743 | 8,404 |
| North Portal..... | | | | | 3 | 11 |
| Regina..... | 536 | 1,803 | 544 | 1,596 | 219 | 598 |
| Moosejaw..... | 253 | 823 | 342 | 1,207 | 363 | 1,227 |
| | 2,261 | 8,201 | 2,618 | 8,321 | 12,393 | 38,237 |
| Yukon— | | | | | | |
| Dawson..... | 118 | 1,347 | 70 | 563 | 627 | 6,087 |
| White Horse..... | 59 | 574 | 13 | 78 | 89 | 573 |
| | 177 | 1,921 | 83 | 641 | 716 | 6,660 |
| Grand total..... | 14,731 | 65,789 | 7,878 | 23,079 | 24,962 | 86,295 |

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EARLIEST APPLES.

From this table it will be noted that during the first period, ending August 31, 11,713 barrels of apples were imported. At this time there are early varieties ready to be placed upon the market in Canada. Yellow Transparent, Red Astrachan, Duchess and similar varieties are ripe in southern Ontario during this month, but very few of these varieties are grown, and the few that are grown are not well grown and are not concentrated at any one point.

SEPTEMBER APPLES.

For the next period of one month, September, 7,873 barrels were imported. This is at a time when Canada is producing large quantities of early apples, but, unfortunately, comparatively little attention is paid to early apples nor have the ordinary apple operators made a business of shipping them. In fact, the method of shipping these early apples is so different from that used for other apples, that it might be considered a special variety of fruit, requiring something of the care that is given to the peach and other tender fruits.

FALL APPLES.

During the next period of three months, ending December 31, 24,000 barrels were imported. This period of three months is the season when shipments could be made of our best fall and early winter varieties, of which there is always a surplus for export.

Looking at these tables simply, it will be noted that the quantity imported from the United States is not large. But small as it is, it should be replaced by Canadian fruit, and it might be if Canadian fruit growers would use the proper methods for distributing their apples. The fact that there are nearly 8,000 barrels imported to the end of August, shows that the people of southern Ontario are not taking advantage of their opportunities. These imported apples travel long distances, have to pay heavy freights, customs duty and all the expenses of the middlemen, consequently they are high-priced to the consumer. The price in Winnipeg up to this time was from \$2.50 to \$3 per box to the consumers. The price was scarcely less in Ottawa and Montreal. This is more than is usually paid for the best winter fruit. It would seem from this that there is at present an opening for an August trade even at these high prices. With the price lower, so as to compete with the other kinds of fall fruit, no doubt a very large trade could be developed. This market, therefore, can be relied upon to absorb all the early fruit that we are likely to grow for some time, not to mention the expansion in the nearby home market as well as the large possibilities in the British market.

APPLE IMPORTS BY PROVINCES.

It is interesting to analyse this table according to provinces. It will be noted that Port Arthur and Toronto are the only two points in Ontario taking any large quantity of fruit. With reference to Toronto, it can be explained that aside from the fact that it is a large distributing point, the channels of trade have been worn in that direction by the banana trade and the trade in strawberries and other early fruit, so that apples follow in the natural course even after the market is well supplied by home-grown fruit. Port Arthur is the terminus of a line of steamers having connections at Detroit and Port Huron. This undoubtedly accounts for the importations there, though orchards adjacent to Windsor and St. Catharines could grow this fruit. Importations into Ontario for the rest of the season are scarcely appreciable.

For the province of Quebec, the importations of fruit follow the lines of trade to Montreal and Quebec. Sherbrooke, no doubt, is influenced largely by the proximity to the American border for part of the importations there. In Nova Scotia

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the excellent facilities by boat bring fairly large shipments to Halifax and Sydney. So, too, in New Brunswick, the boat lines between Boston and St. John facilitates the trade in apples, St. John importing early in the season and exporting a larger quantity later in the season to American ports.

In Manitoba the importations are conveniently made from the large cities, Chicago, St. Paul, Minneapolis, to Winnipeg and to Brandon. The total for the whole province to the end of December is 12,489 barrels. Alberta and Saskatchewan for the season imported 30,000 barrels, much of which might quite readily be displaced by apples from the other provinces. British Columbia imported 17,000 barrels. It would appear, therefore, that British Columbia is not yet in a position to do much more than supply home demands, though there is a large and growing trade with the northwest provinces.

NORTHWEST MARKET DESERVES THE ATTENTION OF SHIPPERS.

Up to January 1st prices were, on the whole, much better in the Northwest than in the British market. It is, therefore, a legitimate conclusion that fruit growers would find the Northwest a very profitable place to dispose of their stock. Indeed, of late years attention has been directed almost exclusively by the larger dealers in Ontario to the British markets, although these importations of American apples show they are neglecting somewhat the home market, which in all countries is the most profitable market for the home producer.

THE NORTHWEST MARKET FOR EARLY APPLES.

The Northwest draws the larger portion (about 8,000 barrels) of the apples used during the months of August and September from the United States. This, of course, is a high priced trade. Indeed, the high prices paid during these months limit the trade to those who will pay for luxuries. The fact that these high prices are being paid is not brought home to the Canadian fruit grower, nor does he know the details of the trade sufficiently well to induce him to risk the expense of trial shipments. It is thus a fact that, though the possibilities exist for a large trade with the Northwest in early apples, the trade is not developed, though the awakening of the apple growers to this chance of enlarging the fruit market is expected in the near future.

That is to say, the Canadian growers will learn that by growing certain varieties and by shipping from certain parts of Canada, the season for Canadian apples can be pushed back to about the first of August. The Yellow Transparent, the Williams, the Lievland Raspberry and the Red Astrachan can be ripened in certain parts of British Columbia and in the southern part of Ontario by the end of July or at latest the first week in August. There is at the present time a market for 150,000 or 200,000 boxes of apples at prices equal to or exceeding the prices for the best winter varieties now at the disposal of the Canadian grower.

During August and September, the very finest of fall varieties are prime for shipping from southern Ontario and parts of British Columbia, and there are in both provinces the soil and climate to produce tens of thousands of barrels of the best early varieties. Lack of enterprise appears to be the only excuse for the shortage in this early fruit. Splendid apple land in southern Ontario is now devoted to growing coarse grains, yielding little more than simply labourer's wages to the grower. This land, if devoted to the growing of apples that could be marketed during August and September, would not only pay double a labourer's wages to the grower, but would give him a net profit of from \$50 to \$150 per acre over and above the cost of production.

The demand for this class of fruit will, of course, increase proportionally with the population. In fact, there is every reason to believe that it will increase faster perhaps than the demand for later apples. This is certainly a market that should be catered to by the Canadian fruit grower. It may be well to state here that it is not

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alone the markets of the Northwest that would absorb this early fruit, but American fruit could be displaced in the larger cities of Ontario, Quebec and the maritime provinces during the months of August and September. These openings, together with the absolute certainty of a good outlet in the British markets, ought to inspire confidence among apple growers and lead to a large planting of early apples in southern Ontario and British Columbia.

THE CONDITIONS OF THE TRADE.

The Basket Trade.

This trade will begin with the Red Astrachan and Duchess, followed by the Gravenstein and Wealthy. These varieties are sent to the nearby markets, London, Hamilton, Toronto and even as far as Ottawa and Montreal in baskets. Shipped in this way they reach the consumer in fairly good order, but shipment in baskets will not suit the long distance trade, though it does fairly well for the nearby markets. The basket is not only too expensive, but does not permit of proper protection of the fruit nor of rapid shipping; the apples are also much more liable to deterioration in baskets than in boxes.

Early Apples in Barrels.

Later in the season these apples are shipped in barrels. It need scarcely be said that this is an exceedingly dangerous practice. The barrel is altogether too large a package for this grade of fruit. The weather is very warm when it is being shipped and this particular class of fruit is soft and decays very rapidly. It can readily be seen that the packing of these apples while they are still warm in so large a package as the barrel, has but one result. Unless the journey is exceedingly short and the weather particularly favourable, a large part of each package will have deteriorated to such an extent that the apples will be entirely unfit for market.

Pre-Cooling and Boxes.

Two conditions are absolutely essential before the business can hope to be completely successful. First, boxes must be used. Second, cold storage or cool storage will place the business on a much better basis. Nothing more need be said in favour of the box. This package is the only one from the fact that it is well ventilated, and is much more readily packed and much more conveniently handled than any other. Another feature that must not be lost sight of is this, that with so large a mass as we have in a barrel, it is impossible to carry soft fruit, like the Astrachan and the Duchess, without bruising by mere pressure from their own weight. This is not the case with the box. It is, therefore, to be hoped that those who are looking to this trade will as quickly as possible turn their attention to this package.

Box Shipments a Success.

Fortunately we have fruit growers enough using the box to be able to speak from actual experience in the matter. The St. Catharines Cold Storage Company shipped both in barrels and boxes, and their experience has been that the box trade is much safer than the barrel trade. The Chatham Co-operative Fruit Association, also large shippers of southern Ontario apples, have almost discarded the use of barrels, and are bringing the box trade to as great perfection as any shippers in southern Ontario. One good effect of the introduction of boxes in the early fruit trade will be the development of a box trade in fancy fall and winter fruit. This is a trade that is now given entirely to the growers on the Pacific coast., though there is not the slightest reason why the growers in the east should not compete for a share of it.

Refrigerator Cars and All Rail.

Closely connected with the packages comes the question of transportation. The ideal transportation will, of course, be by refrigerator car. At the present time, a

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large percentage of these apples are shipped in ordinary cars to the lake port, Sarnia, Goderich, Owen Sound or Collingwood, reshipped there by steamer to Fort William or Port Arthur, and from there shipped by rail again to the Northwest points. The inspectors in the Northwest have been asked to investigate as far as possible into the relative merits of the lake and rail and the all-rail routes. They have no hesitation in saying that the fruit shipped by rail shows up in general better than the lake and rail shipments. The fruit shipped in refrigerator cars turned out infinitely better, where properly iced, than did the fruit in ordinary box cars.

Delays at Shipping Station.

There yet remains a great deal to be done in securing facilities for prompt shipment from the orchards to the distant markets. The fault is sometimes with the apple operators who have the fruit picked and packed in barrels, and then may not have the sale made, and allow the fruit to stand one or perhaps two weeks before ordering it to be shipped. This, however, is not so frequent as lack of promptness on the part of the railways to furnish cars. This is a frequent source of complaint, and it is not too much to say that the inexcusable delinquencies of the apple operators and the transportation companies reduce the value of the crop at least 25 per cent.

How to Load Car with Boxes.

Even in the matter of loading the cars the Canadians have yet a great deal to learn. They do not appreciate the value of ventilation even in refrigerator cars. It is usual for Canadian shippers, both from British Columbia and from Ontario, to ship to the Northwest without using any dunnage between the layers of boxes. This is a mistake which the Americans do not make. The American fruit coming into Winnipeg is all carefully dunnaged between each layer of boxes and tacked at intervals so that the load within the car itself is perfectly immovable, no matter how severe the shunting may be. This may appear a minor point, but it is the means of saving many dollars in preserving the condition of the fruit.

Box Packing and Grading.

The Canadian packers fail to grade closely enough. They have not yet acquired the art of packing boxes properly, and quite frequently will resort to methods of filling the box which should not be countenanced. One of the first principles of box packing is that all the apples in a particular box should be as nearly as possible of the one size. Quite frequently eastern apples are packed so as to show one layer in the box smaller than another, a device which has been adopted not for the purpose of deceiving the buyer, but for the purpose of bringing the apples up to the proper height in the box at the time of packing. This simply shows that the packer does not understand his business. It is quite possible,—and this is frequently demonstrated in every good packing house—to pack any size or shape of apple in our standard box without resorting to any device such as using a smaller tier of apples or using packing material at the top or bottom.

THE QUALITY OF WINTER APPLES SHIPPED TO THE NORTHWEST.

Though there was much good fruit sent from Ontario to the Northwest last year, there was unfortunately a large quantity of very inferior stock. The following letter from a consumer in the far Northwest will help, perhaps, to form public opinion in Ontario with reference to this trade.

SASKATCHEWAN, November 13, 1903.

DEAR SIR,—I would like to write you *re* the quality of apples we are getting shipped up to us from Ontario this fall.

I bought recently a barrel of apples from the Trading Company at Glen Ewen, Saskatchewan. They were marked 'No. 1 Spy,' packed by

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Zenda, Ontario. After getting the barrel home, I opened it, taking a mean advantage of the packer by opening the bottom. At a very conservative estimate, there was fully 75 per cent of spoiled fruit in the first eight inches in the barrel. Some of the apples were entirely rotten and others were all badly gone. I did not empty the barrel, but could see lots of other bad fruit down in the barrel; and what is more, the apples were not Northern Spies. They were fine large apples, solid (i.e. the good ones), juicy and fit for eating now. I took the barrel back, and we opened another barrel of No. 1 Spy, same packer. The apples in this barrel were No. 1 Spy all right, as far as size and kind were concerned, but in picking over the barrel we took out twelve pounds of bad apples, some entirely rotten and others nearly so. The manager of the company had another barrel of so-called No. 1 Spy opened and asked me what I thought of it. As far as size is concerned it was a poor No. 2 Spy. A barrel of No. 1 Snows examined was unmentionably bad. These were practically the first barrels opened in the consignment, so I presume the balance will be proportionally no better.

There were a lot of complaints last year about the Ontario apples shipped here, and it seems to me as if some of the Ontario shippers think any old apple at all is good enough for us. Apparently the Fruit Marks Act is not a deterrent to them. Possibly if it were looked after a little stricter and a respectable sized fine applied, they might think it would pay to be good.

A young lady from Ontario who works in the store told me she was surprised at the kind of apples shipped up here. Such apples as these, she said, would not be considered usable; they would not be worth picking up. More might be said on this subject. I thought it only right to let you know about these shipments.

Yours, &c.,

(Sgd.)

The cost and conditions of transportation are such that few of the consumers have more than one chance a season to get their supply of apples. Consequently, the disappointment that comes from such experiences as the above is most bitter, and will serve to lessen the trade materially. Every apple grower in Canada should feel a personal interest in the kind of fruit which is shipped to the Northwest. If the dwellers in the far west continue to receive fruit fraudulently packed and marked, the tendency will be to do without fruit and very soon the fruit eating habit will be lost and with it a very valuable market. It cannot be too strongly impressed upon the owners of orchards that every incident of this sort lessens the value of their particular orchards, and that they have a personal and individual interest in maintaining the proper standard of marking and packing fruit. They will, therefore, not only pack honestly and mark honestly themselves, but they will not be, directly or indirectly, the instruments through which others may use fraudulent practices. Too frequently the owners of orchards sell to men whom they know are not honest. It is not an uncommon thing to find a man who has a good reputation among his neighbours in other respects, allow fruit to be packed fraudulently in his orchard, with his knowledge, but of course after he has sold it in the lump.

INDIVIDUAL GROWER AND RETAILER CANNOT GET TOGETHER.

The difficulties of the Northwest trade are great. There can be no extensive direct trading with safety between individual growers in Ontario and individual retailers in the Northwest, for the simple reason that it is impossible for these people to become personally acquainted with each other, and without a personal acquaintance with each other trading would be hazardous.

SOME DISHONEST GROWERS.

Every grower in Ontario cannot be trusted with an order when he is to pack and ship his own fruit. Indeed, whether as the result of low moral character or want of knowledge of the art of packing and grading or of misconception in the matter of

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grading, the gravest of complications are sure to arise if it is assumed that the fruit growers can be trusted individually in all cases.

SOME DISHONEST RETAILERS.

On the other hand, it is equally certain that there are a number of retailers in the Northwest who cannot be trusted implicitly. If fruit is sent to them, leaving it to them to determine its condition and, consequently, its price, the results will be far from satisfactory to the grower.

TWO DIFFICULTIES IN DEALING WITH THE WHOLESALE MERCHANTS.

If the trade is done through the large fruit merchants in the business centers, two difficulties present themselves. First, there are frequent delays in the distribution of the fruit. Even with the very best of business facilities, a wholesaler will of necessity have some delays at the point of distribution which will very likely prove fatal to the condition of the fruit.

Second, it is affirmed that when the individual fruit growers have placed the trade entirely in the hands of the wholesalers in the Northwest, the wholesalers take advantage of these conditions and absorb nearly the whole of the profits that should be more evenly distributed between the consumer, the middleman and the producer. As a consequence, dealing through the wholesale merchants under present conditions makes the fruit dearer to the consumer and realizes only a small price for the producer, with, let us say, somewhat more than a fair profit to the wholesaler. Double the business might give the wholesaler the same net profit and, at the same time, furnish the consumer with fruit at a much lower price, and give the grower an outlet for twice as much produce at a fair profit.

CO-OPERATION THE REMEDY.

Co-operative associations would remedy both evils. The shipments, even when made through the wholesale house, might go direct to the retailer, and the amount at stake would be so large that the association would have a representative on the ground to regulate prices and profits.

FRUIT MEETINGS.

Instruction in the provisions of the Fruit Marks Act and in its application to practical conditions can never be final. New men are constantly taking up the business of fruit growing and selling and new conditions are always presenting themselves. For these and other reasons it is very desirable that the Dominion fruit inspectors keep in constant touch with the fruit growers and the fruit packers. Fruit meetings of various sorts afford splendid opportunity for this. Consequently provision is made that all the large gatherings of fruit growers shall be attended by one or more of the inspectors. It is not by any means essential that they shall be on the programme on every occasion, although as a matter of fact, it is very seldom that there is a large gathering of fruit growers without one or more items being furnished by some of the fruit inspectors.

INSPECTORS IN SYMPATHY WITH FRUIT GROWERS.

A very important part of their work can be done by meeting the fruit growers singly or in groups, before and after the meetings, to find out their special needs, making explanations on disputed points in the Fruit Marks Act, or in discovering facts with reference to the fruit trade that they can always turn to account in their inspection work.



British Columbia Fruit.

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It also enables the fruit growers to appreciate that the inspectors are working wholly and solely for the general good; and, on the other hand, it enables the inspectors to see things from the point of view of the fruit growers and fruit packers. This intercourse between inspectors and fruit growers is accountable, no doubt, for the happy relations that exist between the staff of the Fruit Division and those whose work they have to inspect.

It is also a partial explanation of the very great change that has been brought about of late years in the Canadian fruit trade. There is no part of the fruit business, whether it is a matter of general culture or a particular fact with reference to the fruit crop of the present season, that they are not familiar with. The inspectors are therefore ready to assist those who need information, and they also by their intimate acquaintance with the details of the work in every neighbourhood, are in a position to discriminate between those who are working with a fraudulent intent and those who may happen to err through misjudgment or absolute ignorance.

FRUIT INSTITUTES.

The qualifications of the inspectors have created a demand for their services for the fruit institutes that have become a special feature of the educational work carried on by the provinces, particularly the province of Ontario.

At the Short Course in Horticulture at the Agricultural College, Guelph, Mr. Carey was in attendance three days, during which time he delivered one address and was in constant requisition during the discussions that followed the addresses. I also attended the Short Course and delivered three addresses.

FARMERS' INSTITUTES MEETINGS.

Mr. Carey attended a series of meetings extending from February 18 to February 23, in the apple districts north of Lake Ontario, at Beamsville and at Stony Creek.

ANNUAL MEETINGS OF THE PROVINCIAL ASSOCIATIONS.

The annual meetings held in the three maritime provinces were attended by Mr. Vroom. Mr. Carey and myself attended the Ontario Provincial Association, and Mr. Maxwell Smith attended the British Columbia annual fruit meeting.

SPECIAL FRUIT MEETINGS.

Special fruit meetings were organized by the Fruit Division in the apple district north of Lake Ontario, and held in the following places: Wicklow, East Colborne, Brighton, Wooler, Castleton and Warkworth. All these meetings were attended by W. W. Brown and P. J. Carey. I attended the three meetings at Wicklow, Colborne and Brighton. These meetings were held in orchards. The attendance was large. The wish was expressed at the meetings that they would be repeated from year to year.

In New Brunswick, Mr. Vroom attended eight meetings in June, all of which were quite successful. There is an increased interest in the valley of St. John in fruit growing. The farmers are taking better care of their trees, and as a consequence, they find that they form the best paying portion of their farms.

MEETING OF THE INTERNATIONAL APPLE SHIPPERS.

This is a very important meeting of the principal apple operators in Canada and the United States. It is particularly valuable, inasmuch as every man attending is keenly interested in the business side of the industry. They come from all parts of the apple-producing country, and consequently, are in a position to give information on a variety of topics. Perhaps at no other gathering is it possible to secure so good

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an idea of the general nature of the crop, though unfortunately this information is not always published in a form to benefit the growers.

The meeting this year was held at Niagara Falls, August 8 and 9, and was attended by Mr. P. J. Carey. I was also able to attend for a few hours while on other business in the neighbourhood.

OTHER MEETINGS.

Mr. Vroom and myself were present at a meeting of the apple shippers at Kentville, N.S., December 18.

Nearly all the inspectors have, during the year, been called upon incidentally to attend informal meetings of fruit growers or shippers.

JUDGING FRUIT.

Mr. Dery, Mr. Carey, Mr. Maxwell Smith, Mr. Vroom and myself have been asked to judge fruit at the fruit fairs on several occasions during the year. This is a very important phase of the work. It enables the judges to point out the good and bad features of packing and packages to a class of fruit growers who are likely to profit by the instruction. It also enables the inspectors to impress upon fruit growers, generally, by visible example, just what is meant by the definitions of the different grades of fruit.

MISCELLANEOUS WORK.

CORRESPONDENCE.

The work of enforcing the Inspection and Sale Act and the fruit crops reports, naturally bring the Fruit Division in contact with a large number of fruit growers and dealers who turn to the Fruit Division for advice in all matters relating to the fruit trade.

Though the Fruit Division is largely concerned with the commercial side of fruit growing, it is impossible, even if it were desirable, to draw the line sharply between the commercial side and the productive side of fruit growing. Growers write to the Fruit Division for information with reference to all phases of fruit growing. Under these circumstances, not remarkable, a very large correspondence has developed that cannot be classified under any particular head. Many letters come in from people who are contemplating taking up fruit growing as a business, making inquiries with reference to particular parts of the country suitable for their purpose, varieties of fruits that are to be recommended, and the market conditions they are likely to meet. A large number of inquiries are also suggested by the Fruit Crops Reports with reference to insect and fungous diseases. We answer all questions with reference to these problems of fruit growing as promptly as possible. In this connection we have availed ourselves of the assistance of the officers of the Experimental Farm and other public officials who can furnish information.

IDENTIFICATION OF VARIETIES.

During the season a large number of specimens of fruit are sent in to be named. We have excellent facilities for doing this work, which is rendered more necessary by the provision in the Inspection and Sale Act that all fruit in closed packages must be marked with the name of the variety of the fruit. Naturally, where there are so many varieties and where seedlings are so common, as in the case of apples and other tree fruits, there are many varieties either quite rare or that have never been named, and it is in the interest of the trade that these should be discovered and properly dealt with, so that their owners will not be rendering themselves liable under the Inspection

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and Sale Act. We, therefore, extend an invitation to all fruit growers to send specimens to the Fruit Division for identification. In the case of apples, these can be readily sent by post if four typical specimens are wrapped individually in paper first and then all four tied in one piece of strong manilla paper. This should be covered with a second covering of strong manilla, and it will then carry quite readily through the post to this office. Soft fruits, such as cherries, peaches and plums, should be wrapped in paper—oiled paper by preference—then wrapped in excelsior, or better, in cotton batting, and then protected with a pasteboard box. In all cases, as much should be told about the history of the fruit as possible, the conditions under which it is grown, and, if possible, a specimen of the leaves and bearing wood should be included. All such specimens may be sent postage free.

I have the honour to be, sir,

Your obedient servant,

A. McNEILL,

Chief, Fruit Division.

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

FOR THE

FISCAL YEAR ENDING MARCH 31

1909

PART V.—COLD STORAGE DIVISION.

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PART V.—COLD STORAGE DIVISION.

CREAMERY COLD STORAGE.

The policy of paying a bonus of \$100 for the erection of suitable cold storages at creameries, was continued during the year and bonuses were paid in full as follows:—

C. Hervey & Co., Amqui, Matane Co., Que.
 G. J. Adams, Adamsville, Que.
 P. H. McIntosh, Beaver, Que.
 G. Eug. Verreault, Dalibaire, Matane Co., Que.
 Felix Rondeau, St. Emélie de l'Energie, Berthier, Que.
 Eug. Godbout, St. Eloi, Temiscouata Co., Que.
 J. A. McNaughton, Flodden (Melboro P.O.), Richmond Co., Que.
 D. Guilbault, St. Gabriel de Brandon, Berthier Co., Que.
 J. J. Cunningham, Garland, Huntingdon Co., Que.
 G. W. Thompson, Kinnear's Mills, Que.
 R. D. McEwen, Kensington, Huntingdon Co., Que.
 A. Laplante, La Minerve, Labelle Co., Que.
 W. Lemay, Ste. Philomene de Fortierville, Que.
 A. J. O'Hara, Rupert, Wright Co., Que.
 A. Page & Frère, Ste. Scholastique, Two Mountains Co., Que.
 J. E. Stultz, Steeves Settlement, Westmoreland Co., N.B.
 Delphis Tetrault, Upton, Bagot Co., Que.
 Robert Allen (Martin's Creamery) Vegreville, Alta.

Louis Menard, St. Lazare, Que., and Jas. Elliott, Tatchurst, Que., were each paid a balance of \$50 which was due on an old application, and which had been withheld for non-fulfilment of conditions. A delayed payment of \$25 was made to B. A. Longdeau, Shefford Mountain, Que., which completed the bonus in his case also.

ICED CAR SERVICES.

The iced car services which have been in operation for several years were continued during the season of 1908. These services are as follows:—

1. Iced cars for butter are run regularly over certain routes weekly or fortnightly, as the case may be, carrying butter in small lots at regular tariff rates. The government guarantees two-thirds of the earnings of the car from starting point to destination plus \$4 per car for icing.

2. Iced cars for cheese are supplied during a limited period for about ten weeks, beginning in July, for shipment of cheese in car loads at regular tariff rates. The cars are supplied by the railway company on demand of shipper in the usual way and the government pays icing charges to the extent of \$5 per car.

3. Iced cars for fruit intended for export in cold storage are supplied on the same terms as the iced cars for cheese.

For particulars of these services see page, part IV.

COLD STORAGE CHAMBERS RESERVED FOR FRUIT.

Shippers of early apples and tender fruits who in the past have wished to take advantage of the cold storage facilities on steamers sailing from Montreal have been hampered in their desires by the difficulty of making shipments large enough to fill

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even the smallest chamber. The temperature necessary for giving the safest carriage to fruit (32-33 degrees F.) as well as other reasons, makes it impracticable to stow other produce in the same chamber, therefore, if the chamber is not filled with fruit there is dead space which must either be paid for by the shipper or lost by the steamship company. The result has been that very little fruit has been shipped in cold storage.

To obviate this difficulty the minister authorized the Dairy and Cold Storage Commissioner to have chambers reserved for fruit only, on four steamers sailing from Montreal to London, as follows:—

- SS. *Ontarian*, sailed August 22, 1908; arrived London, September 3.
- SS. *Sicilian*, sailed August 29, 1908; arrived London, September 11.
- SS. *Hurona*, sailed September 5, 1908; arrived London, September 17.
- SS. *Hungarian*, sailed September 19, 1908; arrived London, October 3.

London steamers were chosen so that direct shipments of fruit could be made to the Franco-British exhibition.

The chambers were well filled and only a small claim has been made on the Department of Agriculture for dead space.

The fruit, including peaches, pears, grapes, and apples, were landed in good condition. Careful examination of its condition was made both at Montreal and at London by the cargo inspectors employed by this branch.

It is likely that this plan of assisting in developing the export of tender fruits will be continued and extended.

EXTENT OF COLD STORAGE SPACE AVAILABLE ON STEAMERS
SAILING FROM MONTREAL AND QUEBEC DURING THE SEASON
OF 1908.

During the season of 1908 there were 46 steamers sailing from the ports of Montreal and Quebec for European ports, with a total cold storage capacity of 1,015,556 cubic feet, and 19 steamships with a total cooled air capacity of 904,790 cubic feet.

Adding together all the sailings that were made during the season, the total available space was 4,907,195 cubic feet of cold storage and 4,217,648 cubic feet of cooled air.

NUMBER OF SAILINGS OF STEAMERS FROM MONTREAL AND QUEBEC, WITH
DETAILS OF COLD STORAGE ACCOMMODATION, SEASON 1908.

Allan Line.

| Name of Steamer. | No. of Sailings. | No. of Chambers. | Capacity in Cubic Feet. |
|---|------------------|------------------|-------------------------|
| To Liverpool - | | | |
| 'Tunisian'..... | 7 | 4 | 21,650 |
| 'Victorian'..... | 7 | 5 | 17,260 |
| 'Virginian'..... | 7 | 4 | 12,440 |
| 'Corsican'..... | 8 | 5 | 24,270 |
| 'Grampian' (part of season only)..... | 1 | 5 | 23,400 |
| To London - | | | |
| 'Sicilian'..... | 4 | 4 | 17,980 |
| 'Hibernian'..... | 4 | 3 | 7,956 |
| 'Hungarian'..... | 2 | 3 | 7,124 |
| 'Ontarian' (part of season only)..... | 2 | 4 | 16,843 |
| 'Pomeranian'..... | 3 | 2 | 8,056 |
| 'Sardinian'..... | 4 | 2 | 9,628 |
| 'Parisian'..... | 3 | 1 | 4,790 |
| 'Corinthian' (part of season only)..... | 4 | 4 | 16,722 |
| To Glasgow - | | | |
| 'Corinthian' (part of season only)..... | 1 | 4 | 16,722 |
| 'Pretorian'..... | 7 | 6 | 25,270 |
| 'Numidian'..... | 1 | 2 | 8,101 |
| 'Ionian'..... | 7 | 6 | 13,553 |
| 'Grampian' (part of season only)..... | 6 | 5 | 23,400 |
| 'Hesperian'..... | 7 | 5 | 23,400 |
| 'Ontarian' (part of season only)..... | 1 | 4 | 16,843 |

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NUMBER OF SAILINGS OF STEAMERS FROM MONTREAL AND QUEBEC—*Concluded.*

Canadian Pacific Line.

| Name of Steamer. | No. of Sailings. | No of Chambers. | Capacity in Cubic Feet. |
|---|------------------|-----------------|-------------------------|
| To Liverpool— | | | |
| ‘Lake Erie’ | 5 | 4 | 21,700 |
| ‘Empress of Britain’ (from Quebec)..... | 7 | 3 | 29,700 |
| ‘Empress of Ireland’ | 7 | 3 | 29,700 |
| To London | | | |
| ‘Montrose’ | 5 | 4 | 23,000 |
| ‘Montfort’ | 4 | 3 | 24,700 |
| To Bristol— | | | |
| ‘Montcalm’ | 5 | 1 | 15,340 |
| ‘Monmouth’ | 5 | 2 | 15,400 |

Dominion Line.

| | | | |
|--------------------|---|---|--------|
| To Liverpool— | | | |
| ‘Dominion’ | 6 | 4 | 40,985 |
| ‘Canada’ | 6 | 4 | 47,915 |
| ‘Kensington’ | 5 | 1 | 25,867 |
| ‘Southwark’ | 3 | 1 | 25,313 |
| ‘Ottawa’ | 5 | 2 | 27,410 |
| ‘Vancouver’ | 1 | 4 | 14,750 |
| ‘Norseman’ | 1 | 8 | 62,840 |
| To Bristol | | | |
| ‘Manxman’ | 5 | 3 | 54,480 |
| ‘Turcoman’ | 5 | 4 | 38,440 |
| ‘Englishman’ | 4 | 4 | 37,600 |

Donaldson Line.

| | | | |
|-------------------|---|---|--------|
| To Glasgow— | | | |
| ‘Marina’ | 5 | 4 | 11,719 |
| ‘Parthenia’ | 6 | 4 | 16,000 |
| ‘Athenia’ | 6 | 4 | 16,122 |
| ‘Lakonia’ | 4 | 4 | 14,526 |
| ‘Cassandra’ | 6 | 3 | 7,770 |
| To Rotterdam— | | | |
| ‘Kastalia’ | 1 | 4 | 13,498 |

Thomson Line.

| | | | |
|-------------------|---|---|--------|
| To London— | | | |
| ‘Cervona’ | 5 | 4 | 15,320 |
| ‘Devona’ | 6 | 3 | 21,953 |
| ‘Hurona’ | 6 | 4 | 20,487 |
| ‘Iona’ | 6 | 4 | 18,472 |
| ‘Latona’ | 1 | 4 | 45,682 |
| ‘Cairnrona’ | 5 | 6 | 20,424 |

Summary.

| | No. of Sailings. | Cubic Feet. |
|-------------------|------------------|-------------|
| To Liverpool..... | 76 | 2,054,624 |
| To London..... | 64 | 1,113,538 |
| To Glasgow | 57 | 956,835 |
| To Bristol | 24 | 768,700 |
| To Rotterdam..... | 1 | 13,498 |
| Totals | 222 | 4,907,195 |

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COOLED AIR SERVICE, 1908.

The following steamships with cooled air service sailed from the port of Montreal during the season of 1908:—

| Name of Steamer. | Number of Sailings. | Cubic Feet Space. |
|------------------------|---------------------|-------------------|
| Allan Line-- | | |
| ‘Pomeranian’ | 3 | 26,000 |
| ‘Hungarian’ | 2 | 45,540 |
| ‘Hibernian’ | 4 | 45,540 |
| ‘Ontarian’ | 2 | 19,000 |
| ‘Sardinian’ | 4 | 17,600 |
| Canadian Pacific Line— | | |
| ‘Montcalm’ | 5 | 18,668 |
| ‘Monmouth’ | 5 | 19,443 |
| Dominion Line— | | |
| ‘Southwark’ | 3 | 41,472 |
| ‘Canada’ | 6 | 46,904 |
| ‘Kensington’ | 5 | 42,116 |
| ‘Turcoman’ | 5 | 40,491 |
| ‘Englishman’ | 4 | 18,617 |
| ‘Manxman’ | 5 | 41,585 |
| Thomson Line— | | |
| ‘Iona’ | 6 | 80,178 |
| ‘Cervona’ | 5 | 97,530 |
| ‘Hurons’ | 6 | 79,707 |
| ‘Devona’ | 6 | 97,574 |
| ‘Latona’ | 1 | 50,086 |
| ‘Cairnrona’ | 5 | 76,739 |

SUMMARY.

| | Number of Sailings. | Cubic Feet. |
|--------------------|---------------------|-------------|
| To Liverpool | 14 | 616,420 |
| “ London | 44 | 2,925,825 |
| “ Bristol | 24 | 675,403 |
| Totals | 82 | 4,217,648 |

THERMOGRAPHS IN STEAMSHIPS, SEASON OF 1908-9.

During the year, 478 temperature records were secured by placing thermographs (recording thermometers) in cold storage, in cooled air and in ordinary storage with butter, fruit, &c. Of these records 444 were obtained in steamers sailing from Montreal and Quebec, 32 in steamers sailing from Halifax and 2 in steamers sailing from Vancouver.

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The thermographs were placed as follows:—

| From Montreal and Quebec. | | WHERE PLACED IN STEAMSHIP. | | |
|---------------------------|--|----------------------------|-------------|-------------------|
| | | Cold Storage. | Cooled Air. | Ordinary Storage. |
| Placed with. | | Times. | Times. | Times. |
| Butter | | 64 | | |
| Cheese..... | | 6 | 19 | 136 |
| Fruit..... | | 24 | | 43 |
| Meats..... | | 21 | 9 | 5 |
| Frozen Salmon | | 6 | | |
| Butter and Meats..... | | 4 | | |
| Cheese and Meats | | 2 | 30 | 41 |
| Apples and Meats | | 6 | 1 | 5 |
| Apples and Cheese..... | | | 5 | 17 |
| Total..... | | 133 | 64 | 247 |
| From Halifax— | | | | |
| Apples..... | | 1 | | 31 |
| From Vancouver— | | | | |
| Apples..... | | 2 | | |
| Grand Total..... | | 136 | 64 | 278 |

BUTTER TEMPERATURES ON BOARD STEAMSHIPS.

During the season of navigation of 1908 the cargo inspectors at Montreal tested the temperatures of 540 packages of butter as these were being loaded into the steamers, each package being marked so as to enable the inspector at the port of discharge to get the temperature of the same package as soon as it was unloaded from the steamer. The temperatures for each line have been averaged for the season, and the results are shown in the following table:—

| Steamship line. | Number of Sailings with Butter. | Number of Packages Tested. | Average Temperature at Montreal. | Average Temperature at Port of Discharge. | Reduction in Temperature. |
|------------------------|---------------------------------|----------------------------|----------------------------------|---|---------------------------|
| Montreal to Bristol— | | | | | |
| C. P. R. | 7 | 88 | 34.3 | 21.2 | 13.1 |
| Dominion..... | 11 | 138 | 35.9 | 25.0 | 10.9 |
| General Average..... | | | 35.3 | 23.5 | 11.8 |
| Montreal to Glasgow— | | | | | |
| Allan | 11 | 43 | 37.8 | 25.7 | 12.1 |
| Donaldson | 9 | 32 | 31.4 | 21.4 | 10.0 |
| General Average..... | | | 35.0 | 23.9 | 11.1 |
| Montreal to Liverpool— | | | | | |
| Dominion..... | 8 | 43 | 37.2 | 20.2 | 17.0 |
| Allan | 5 | 43 | 37.8 | 29.8 | 8.0 |
| C. P. R. | 1 | | | | |
| General Average..... | | | 37.5 | 25.0 | 12.5 |
| Montreal to London— | | | | | |
| Thomson..... | 16 | 144 | 39.4 | 17.7 | 21.7 |
| Allan | 3 | 9 | 42.0 | 25.9 | 16.1 |
| C. P. R. | 1 | | | | |
| General Average..... | | | 39.6 | 18.2 | 21.4 |

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SHIPMENTS of Perishable Products in Cold Storage and Cooled Air from the port of Montreal, season 1908 (U.S.A. products included.)

| | In Cold Storage. | In Cooled Air. |
|--|------------------|----------------|
| Apples (bbls.) Canadian | 6,109 | 1,338 |
| " (boxes) " | 2,077 | 25 |
| Butter (pkgs.) " | 89,875 | ..... |
| " " U.S.A. | 2,530 | ..... |
| Cheese (boxes) Canadian ..... | ..... | 375,318 |
| Meats " Canadian | 3,627 | 25,812 |
| " " U.S.A. | 42,518 | 4,479 |
| Lard (pkgs.) Canadian | 100 | ..... |
| " " U.S.A. | 7,396 | 1,800 |
| Tender Fruits (boxes) Canadian | 11,935 | 2,404 |
| " " " U.S.A. | 12,569 | 22,858 |
| Fruits and Vegetables (boxes) Canadian ..... | ..... | 482 |
| Beef (quarters) U.S.A. | 1,619 | ..... |
| Pork (bales) Canadian | 267 | ..... |

SHIPMENTS of Perishable Products in Cold Storage and Cooled Air from the port of Quebec, season 1908 (U.S.A. products included).

| | In Cold Storage. | In Cooled Air. |
|-------------------------------|------------------|----------------|
| Apples (bbls.) Canadian | 2,871 | ..... |
| " (boxes) " | 2,512 | ..... |
| Cheese " " ..... | ..... | 4,385 |
| " " U.S.A. .... | ..... | 181 |
| Meats (boxes) Canadian | 383 | ..... |
| " " U.S.A. | 9,487 | ..... |
| Lard (Pkgs.) " | 1,665 | ..... |
| Pears (cases) " | 309 | ..... |

COLD STORAGE FOR APPLES.

The apple is probably the most useful and the most highly esteemed fruit known to man. Its wide distribution, the excellent keeping qualities of some of its varieties, and the number of secondary products which can be made from it have promoted the use of the apple over a great part of the civilized world. Growing in the temperate regions of the earth and, therefore, in both the northern and the southern hemispheres, the opposite seasons combine to provide a more or less continuous supply throughout the year.

HOW COLD STORAGE MAY ASSIST THE INDUSTRY.

Cold storage which has done much already, and will do more in future, towards extending the usefulness of the apple as a food for man, is destined to materially assist in developing the growth of the apple industry. A large quantity of apples go to waste every year in Canada. The general application of cold storage will not prevent all the waste which occurs at present, because many of the apples that are not used are defective, through the attacks of insect and fungus pests, to such an extent as to be unfit for preservation in cold storage, but it can be utilized to preserve the crop of *sound* apples over periods of glut in the market and until such time as there may be profitable demand for them. There is this to be said also, that under ordinary conditions a large proportion of the apples are over-ripe and more or less damaged when offered to the public. If these apples were in better condition, as they would be

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if properly stored, the increased value and lessened risk would encourage heavier purchase and greater consumption.

The steadiness in the markets which would result from the judicious employment of cold storage, and the greater measure of stability which the trade would assume, would all tend to an increased dependence on the apple as a regular food supply.

MATURITY AND RIPENESS OF APPLES.

The life history of the apple is one of growth and maturity up to a certain point, after which the process of decay and disintegration sets in. A distinction should be made between maturity and ripeness. An apple may be considered 'mature' when it is full grown and properly coloured. It may be said to be 'ripe' when it has reached the stage of its best condition for eating. The period of time which may elapse between full maturity and full ripeness varies exceedingly according to variety. The length of this period may be influenced to a very considerable degree by the temperature at which the apple is held. Early fall or summer apples naturally ripen very quickly after maturity. In some varieties, under normal weather conditions for the season of the year, the stage of ripeness follows that of maturity in a few days. In other varieties, maturing later in the season, the period between maturity and ripeness is materially lengthened, until we find the later winter varieties ripening two or three months after maturity, under the ordinary temperature conditions which prevail at that time of the year. The warmer the weather is at the time the apple matures, and the more it is exposed to the high temperature, the shorter the time between maturity and ripeness, other things being equal. During the seasons when hot weather extends into late September or October, winter apples are ripened so quickly that they do not have their usual keeping quality.

DIFFERENCE IN STORAGE FOR EARLY AND LATE APPLES.

The cold storage of apples may be considered under two heads: first, there is the chilling of early fruit for short periods, to prevent it from becoming over-ripe long enough to stand transportation. In those parts of Canada where apples mature during hot weather it is impossible to handle the early fruit in a satisfactory manner without some means of chilling it as soon as it is taken from the tree. Cold storage is also valuable for the handling of winter apples when they mature during warm weather. If placed at once in cold storage and held there until the cold weather comes on, they will be kept in much better condition for consumption during the late winter months than if the ripening process is allowed to proceed rapidly after the apples are taken from the trees.

SOME CONDITIONS WHICH INFLUENCE THE KEEPING QUALITY OF APPLES IN COLD STORAGE.

It has been shown clearly, by careful experiment, that well matured, *i.e.*, full grown and well coloured apples, keep better in cold storage than they do if picked in green condition, for the obvious reason that the skin of the apple is its natural protection against decay, and, therefore, it reaches its highest efficiency at the full maturity of the apple. Apples which are liable to 'scald' are much less subject to this defect if they are well matured and well coloured. It follows, therefore, and it has been proved by experiment, that apples grown on bushy, unpruned trees with heavy foliage, which shuts off the sun and prevents a free circulation of air, will not keep as well as apples from a well-cared for orchard.

It should be noted also that apples which are overgrown and immature as the result of prolonged and late growth of the tree, following errors of cultivation or an unusual amount of moisture in the soil during the early fall, will not keep as well as fruit from trees the growth of which has been checked earlier in the season. It has been found that the product of very young, rapidly growing orchards will not,

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as a rule, keep as well as the fruit from well matured trees which are properly cared for and judiciously cultivated.

IMPORTANCE OF CARE IN HANDLING.

It is highly important that apples which are intended for cold storage should be handled with the greatest care, to avoid bruises or skin punctures. The slightest puncture of the skin permits the entrance of the spores of mould which cause the rots in the apple. A bruise weakens the skin and thus permits the early entrance of the moulds at that point. It is absolutely useless to expect imperfect specimens to be preserved in cold storage, because the moulds which cause rots continue to grow at storage temperatures. While the skin is sound these moulds cannot penetrate, but when the life processes have proceeded far enough to cause a breaking down of the skin itself, they gradually begin to find entrance and hence the life of the apple is ended. All schemes of cold storage for apples, should be planned to involve as little handling as possible.

PROMPT STORAGE IMPORTANT.

Too much stress cannot be laid upon the advantage of getting the apples into store immediately after picking, if a maximum preservation is expected. A few days of high temperature, even a few hours in the case of early varieties, are sufficient to hasten the life processes to such an extent as to limit the opportunities for successful marketing.

COLD STORAGE OF APPLES MAY BE OVERDONE.

The cold storage of apples might easily be over done. The earliest varieties should be rushed to the market as quickly as possible to avoid the competition of later and possibly more popular varieties. It would be quite practicable, for instance, to preserve the Duchess or Red Astrachan, if placed in storage at the proper time, for several weeks or even months; but it would not be good business to do so, because the trade would be shy of such varieties out of season. Prompt chilling is all that cold storage should be expected to do for apples of this class. Without this chilling it is easy to flood the market on account of the unsatisfactory condition of the fruit. Even with varieties for which the season might be extended for several weeks, some caution is necessary, because if an apple like the Gravenstein, for example, was carried much past the time when experience has taught every one that it has reached its best and may be expected to 'go down,' dealers would hesitate before handling it. By degrees, however, the season for superior varieties, such varieties as would compete with other and later varieties, might be considerably extended. The Rhode Island Greening is a good type of this class. The season for the Greening has been extended for six weeks or two months in the United States by means of cold storage, with the decided advantage that it misses the competition of cheaper varieties. The Greening is always in favour as a culinary apple. The question of variety should be carefully considered in selecting a stock for cold storing.

It is a mistake to suppose that all Canadian apples require cold storage. In the cooler regions late or slow maturing varieties may be preserved fairly well if properly handled in ordinary frost proof warehouses. While cold storage would lengthen the season of all apples, the gain in value would not be equal to the expense in all cases.

PACKAGES IN COLD STORAGE.

The question of package is of some importance in the cold storage of apples. In the case of the early varieties, for which quick cooling is important, the box package on account of its smaller size and, therefore, greater extent of surface as compared with bulk, undoubtedly facilitates the attainment of the object in view. With later

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varieties for which quick handling is not so important, the barrel carries no serious objection.

The question as to whether the package should be ventilated or not depends on circumstances. The ventilation facilitates rapid cooling, but if the packages are likely to be exposed to a warm, moist atmosphere when removal from storage, any openings in the packages only increases the tendency to 'sweat,' as the condensation of moisture on the cold surface of the apples is usually described. On the whole, the advantages seem to be in favour of the ordinary package.

WRAPPERS AND COLD STORAGE.

All apples will keep better if wrapped in paper. The wrapper helps to prevent the bruises which may result from the handling and the pressure of tight packing, and it also prevents the spread of mould spores or other germs of decay from one apple to another. The wrapper offers the further advantage that it prevents, to some extent, the collection of moisture on the surface of the apple when it is changed from a low temperature to a comparatively high one.

The wrapper is obviously more useful on early and tender varieties than on later and firmer ones. Circumstances and labour resources must guide the individual in determining how far it will pay to carry the matter of wrapping.

COLD STORAGE TEMPERATURE FOR APPLES.

The most effective temperature for the preservation of apples is that which comes nearest to their freezing point without actually touching it. Different varieties freeze at slightly varying temperatures according to their composition, but 32 degrees Fahrenheit is as low as it is safe to go. It should be kept as near that point as possible. A degree or two will make a marked difference in the keeping of the apples.

SUBSIDIES FOR COLD STORAGE WAREHOUSES.

Contracts for the payment of subsidies under 'The Cold Storage Act' have been entered into during the year with the following:—

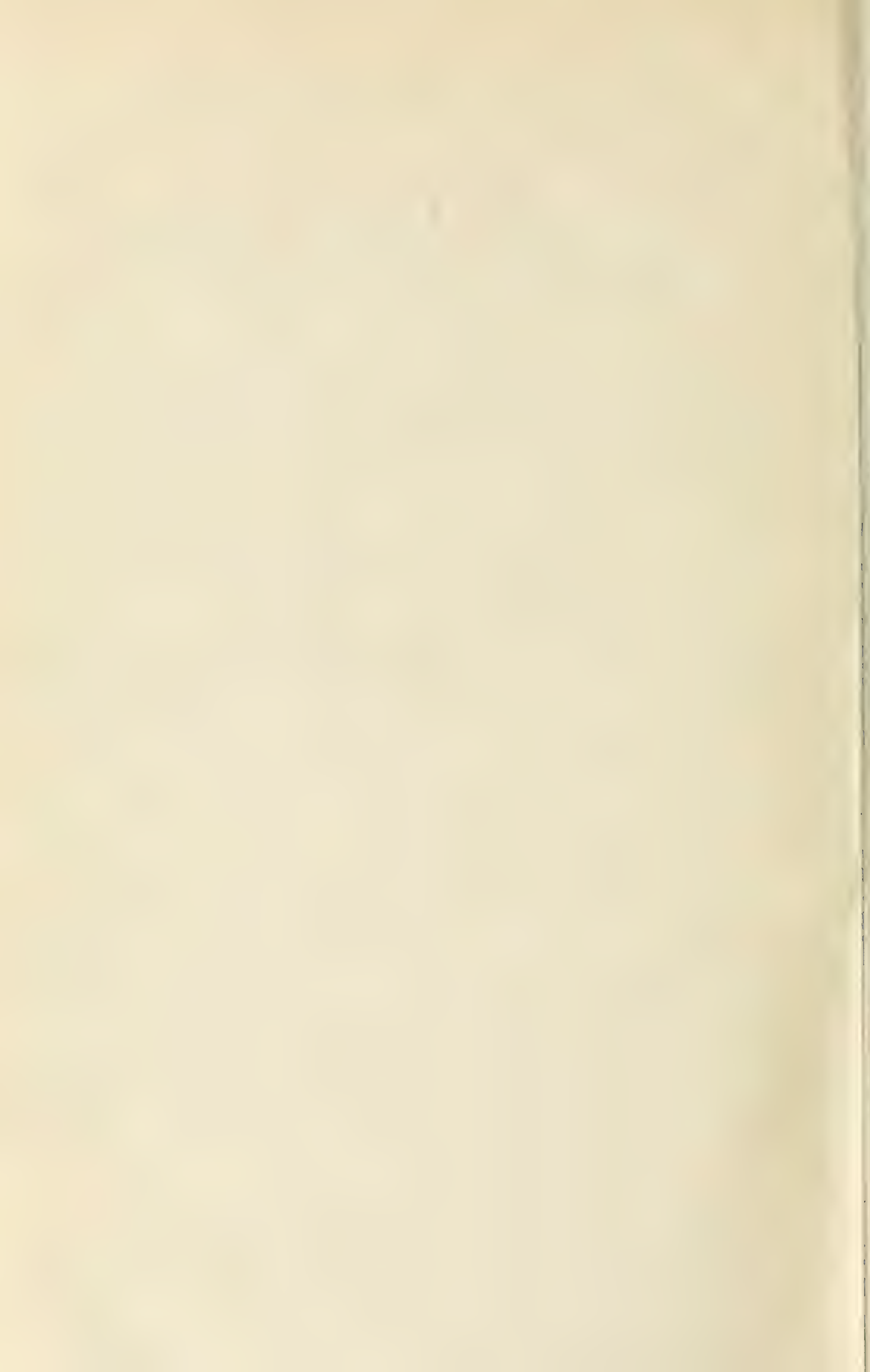
Cold Storage, Limited, Woodstock, N.B.

Scott and Hogg, Peterborough, Ont.

The Halifax Cold Storage Co., Port Hawkesbury, N.S.

The Trenton & Atlantic Storages, Trenton, Ont.

The last named has not yet been completed. Several applications for the subsidy are under consideration at the time of present writing. It is doubtful if any of these warehouses or those mentioned in last year's report, would have been erected without the inducement offered by the provisions of 'The Cold Storage Act.' The business of cold storage has been stimulated and promoted by the prominence given to the subject by the passing of the Act in the first place, and by the discussion of the subject which has accompanied the various proposals for the erection of warehouses. Even in cases where efforts to establish cold storage warehouses have been unsuccessful, the attempt has been of more or less educational value.



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